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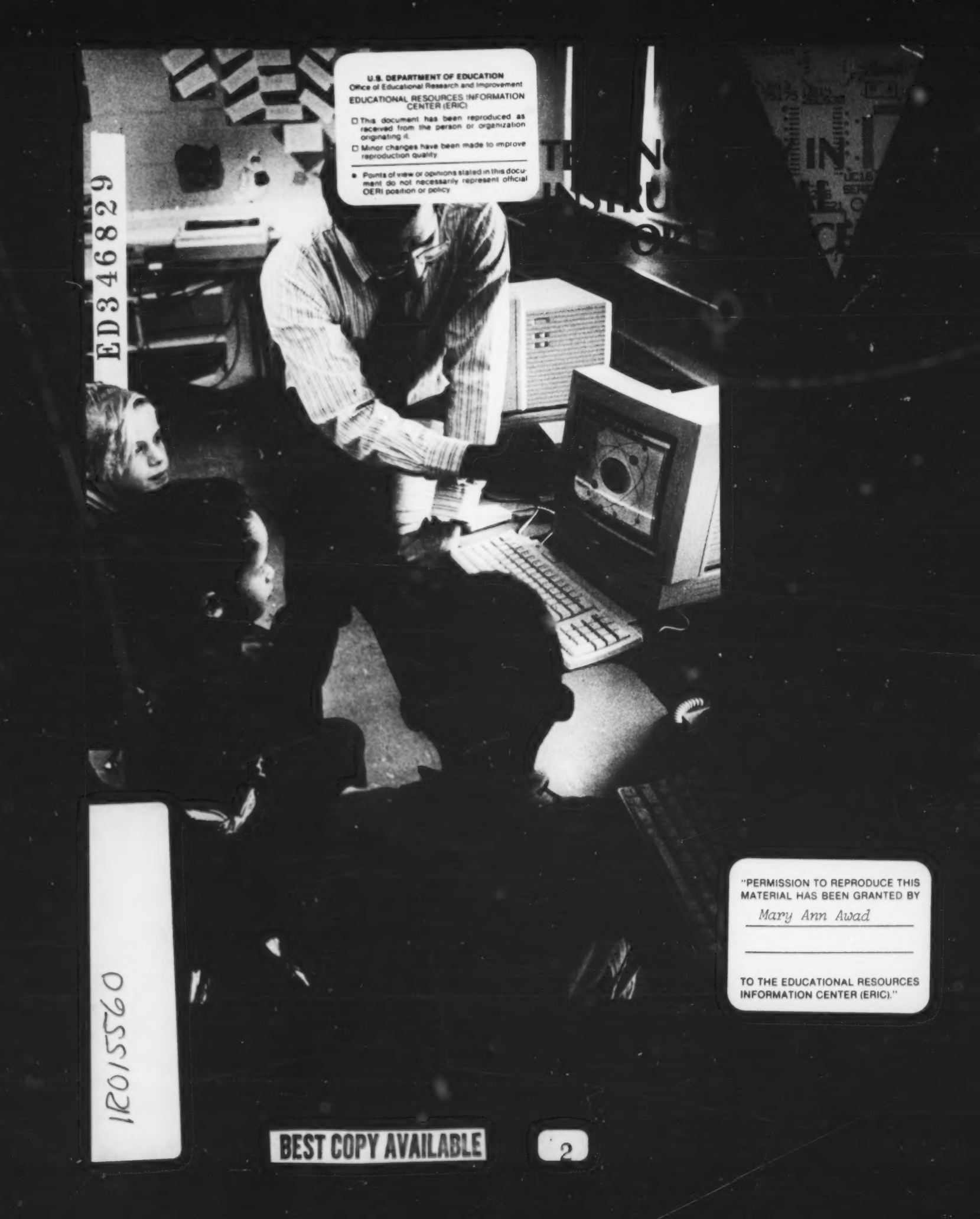
ABSTRACT

This manual is intended to provide directors of funded programs and teachers with an awareness of a wide range of technology services, programs, and applications for improving the quality and effectiveness of instructional support services in New York State schools. The first of nine chapters contains two papers: "Technology Support for Instructional Support Services Themes," which provides a description of management and instructional technology programs for helping teachers improve effectiveness; and "Context: Role of Technology in the 'New Compact for Learning'" a framework for guiding the use of information technology within instructional support programs. The second chapter, "Current Status of Technology in Instructional Support Services," describes the results of a 1991 statewide survey on the uses of computer technology in instructional support programs. Chapter 3, "Planning," begins with a brief review of several basic questions that form a framework for initiating the technology planning process, and then describes the State Education Department's Technology Planning for Improving Schools (TPIS) process. An overview of the major features of the Model Schools Program, which provides teacher training for integrating technology into the curriculum, is presented in chapter 4. Chapter 5 discusses software evaluation and selection, identifying steps in the process and criteria for software. Chapter 6, "Applications and Programs," describes several current technology services for management and instruction, including the Technology Network Ties (TNT) system that links schools, BOCES, and the State Education Department through a computer network. Examples are given of local school districts using such applications as communications technologies, management and instructional support programs, computer software applications, distance learning, and video technologies. Chapter 7 discusses the relationship between business and schools and provides examples of recent partnerships forged between the State Education Department and technology corporations. Chapter 8, "Funding for Technology in Instructional Support Services," identifies several current state and federal funding sources for supporting the implementation of technology. Chapter 9, "Profiles: Technology Applications in Instructional Support Services," presents short descriptions of 26 programs in New York State, including the equipment used, staff development, instructional results, funding, and contact persons. A glossary of program terms and acronyms concludes the manual. (DB)



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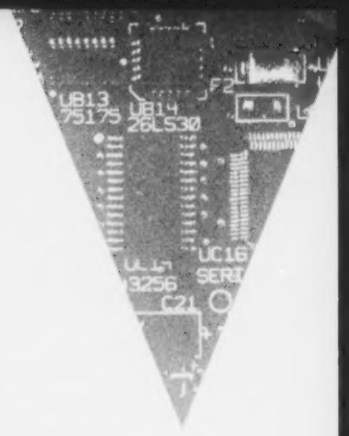

TECHNOLOGY IN INSTRUCTIONAL SUPPORT SERVICES

December 1991

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The State Education Department
Office of Elementary, Middle and Secondary
Education Planning, Assessment and Technological Servives
Office of Grants Management and Compliance
Albany, New York

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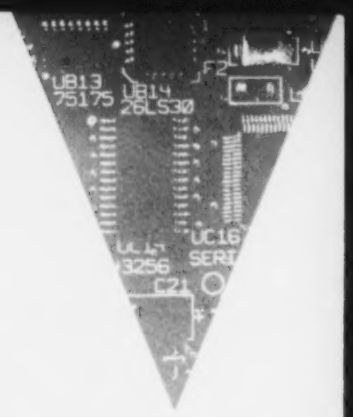

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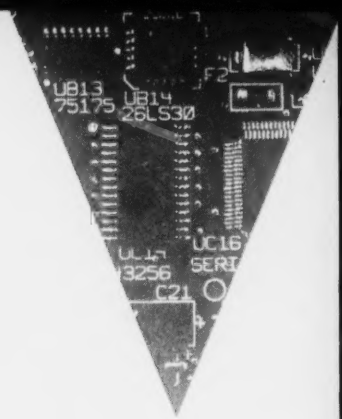


FOREWORD

The major purpose of this publication is to provide Directors of Funded Programs and teachers with an awareness of a wide range of technology services, programs, and applications for improving the quality and effectiveness of instructional support services in New York State schools. It has been jointly developed by the New York State Education Department and representatives of the New York State Association of Compensatory Educators' Technology Committee during the summer and fall of 1991. Instructional support staff can use these technology programs to help their students succeed in the regular school program, attain grade-level proficiency, and improve achievement in basic and more advanced skills.

The publication includes the following chapters:

CHAPTER 1. ROLE OF TECHNOLOGY

A. Technology Support for Instructional Support Services Themes
B. Context: Role of Technology in the *New Compact for Learning*

Chapter 1, Part A, "Technology Support for Instructional Support Services Themes" describes management and instructional technology programs for helping teachers improve their effectiveness in delivering instructional support services to students. Six major Regents' themes for improving instructional support programs are briefly summarized. These include: program congruence; managing instructional time to enhance program congruence; generating and monitoring the progress of achieving desired outcomes; program improvement; strategies for organizing instructional support services; and parent partners. Several technology systems are described for gathering and analyzing student data, for resource sharing and communications, and for enhancing the quality of instruction in the classroom.

Part B "Context: Role of Technology in the *New Compact for Learning*" provides a framework for guiding the use of technology within instructional support programs in schools. The *New Compact for Learning*, approved by the Regents in March 1991, proposes strategies to improve educational results in the 1990s and effectively prepare children for the future. One primary focus of the *New Compact* is the role of technology for enhancing the teaching/learning environment in schools. The Regents *Long-Range Plan for Technology in Elementary and Secondary Education in New York State* (June 1990) includes several recommendations for integrating technology at all dimensions of the educational system by 1995. A brief review of how the *Long-Range Plan for Technology* supports the *New Compact* is presented as a context for planning technology applications for instructional support programs.

While all programs are briefly described in the chapter, boxes are provided which refer the reader to detailed descriptions presented in later chapters of the publication. A glossary of terms is provided in the appendix with definitions of technology programs and applications.

CHAPTER 2. CURRENT STATUS OF TECHNOLOGY IN INSTRUCTIONAL SUPPORT SERVICES

A profile of the current uses of technology is an important foundation for the future planning and implementation of technology in instructional support programs. Chapter 2, "Current Status of Technology in Instructional Support Services" describes the results of a statewide survey on the uses of computer technology in instructional support programs that was conducted in the spring of 1991. The survey was jointly developed by the State Education Department and the New York State Association of Compensatory Educators' Technology Committee. The survey results represent another important foundation for the development of this publication.

CHAPTER 3. PLANNING

A comprehensive planning process that involves all educators within a district is critical to ensure that technology is effectively integrated within the teaching/learning process. The need to develop an effective technology planning process was identified through the survey results. Chapter 3, "Planning" begins with a brief review of several basic questions that form a useful framework for initiating the technology planning process. Following these questions, an abstract of the State Education Department's, *Technology Planning for Improving Schools* (*TPIS*) process is presented. The description of the major activities of *TPIS* provides instructional support staff with a useful model for developing their own plans for the integration of technology.

CHAPTER 4. STAFF DEVELOPMENT

In addition to the need for planning, the survey results also indicate that instructional support staff need comprehensive staff development. Chapter 4, "Staff Development" overviews the major features of the Model Schools Program, which was initiated in 1985-86 with several school districts to provide teachers with comprehensive training for integrating technology within the curriculum. The review of the Model Schools program includes descriptions of publications and lesson plans developed by participating teachers. The Model Schools' approach represents a viable model for training instructional support staff to use a wide range of technology applications in their classrooms.

CHAPTER 5. SOFTWARE EVALUATION AND SELECTION

The evaluation and selection of computer software may be the most critical step in effectively integrating technology with curricular goals. Chapter 5, "Software Evaluation and Selection" identifies steps for selecting computer software and also includes a form that may be used to evaluate selected software.

CHAPTER 6. APPLICATIONS AND PROGRAMS

Chapter 6, "Applications and Programs" describes several current technology services for management and instruction. This chapter begins with a review of the statewide Technology Network Ties (TNT) system that links schools, BOCES, and the State Education Department through a computer network for communications and services. The applications include: communications technologies; management and instructional support programs; computer software applications; distance learning; and video technologies. Examples of local school districts that are using each of these applications to support their educational programs are provided.

CHAPTER 7. INDUSTRY PARTNERSHIPS

Several recent partnerships have been forged between the State Education Department and technology corporations to implement the *Long-Range Plan for Technology* in schools. Chapter 7, "Industry Partnerships" describes the educational focus of each partnership site. These sites were selected because they had developed comprehensive technology plans and provided staff development on the use of technology for district staff. The sites also use a wide variety of the technology programs described in the preceding chapter. They represent models for effective integration of technology.

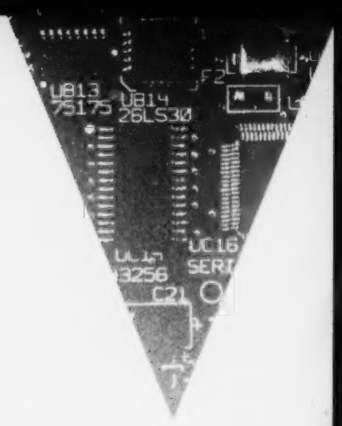
CHAPTER 8. FUNDING FOR TECHNOLOGY IN INSTRUCTIONAL SUPPORT SERVICES

The provision of adequate funding is critical to ensure that schools have the necessary resources for acquiring and implementing technology. Chapter 8, "Funding for Technology in Instructional Support Services" identifies several current State and Federal funding sources for supporting the implementation of technology.

CHAPTER 9. PROFILES: TECHNOLOGY APPLICATIONS IN INSTRUCTIONAL SUPPORT SERVICES

Chapter 9, "Profiles: Technology Applications in Instructional Support Services" includes profiles of promising technology applications in instructional support services. The profiles contain the following information: an overall program description; special equipment/technology used; a staff development component; the instructional results; funding source(s); a description of how the technology application promotes congruence; and the site contact person.

In summary, the publication describes a wide array of programs, services, and resources that may be used by program directors and teachers for implementing technology in instructional support services. These programs will help educators access required student data, generate electronically reports and program plans, and collect and analyze evaluation data for categorically funded programs. In addition, the publication describes technology programs for promoting congruence, enhancing planning, and providing staff development.



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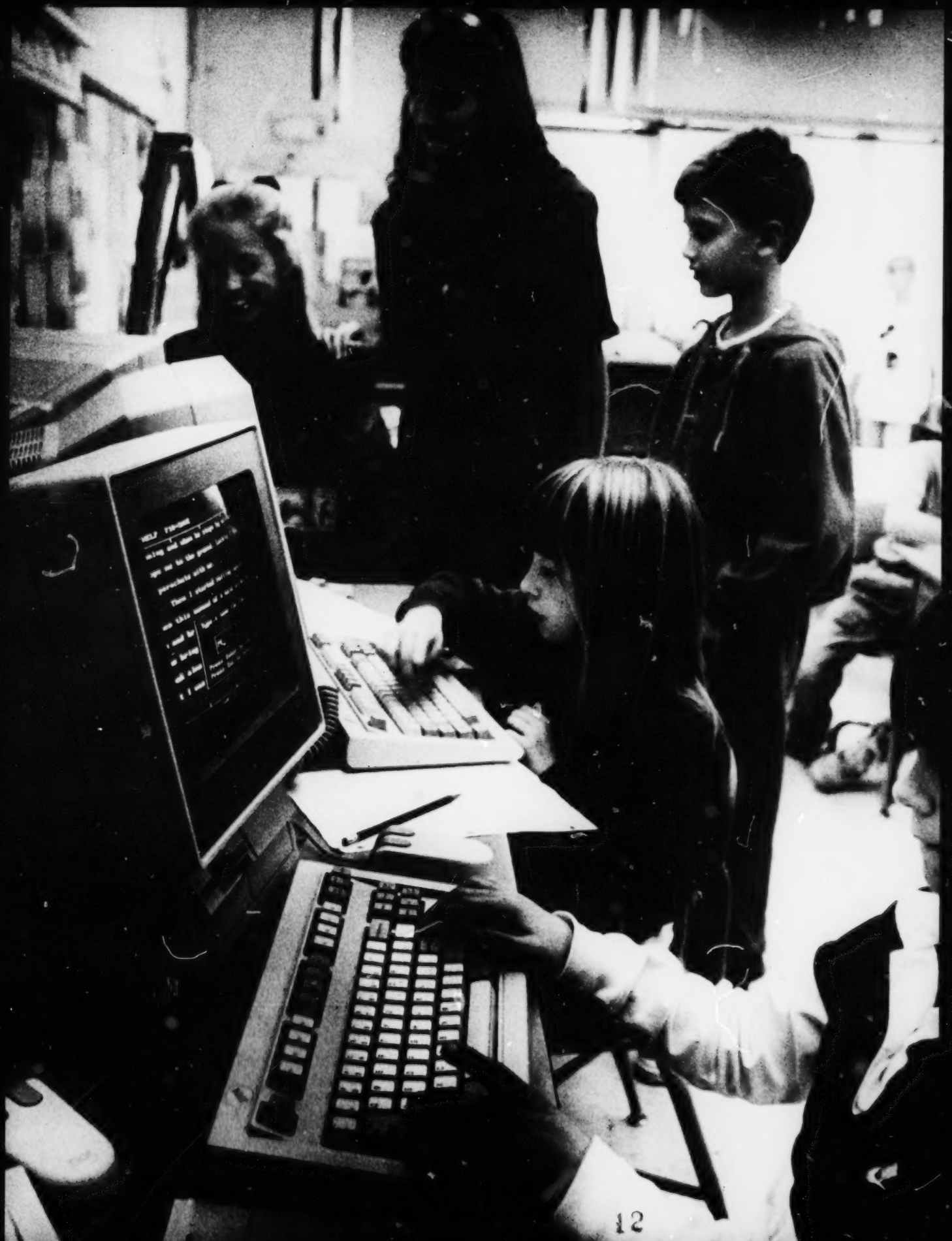
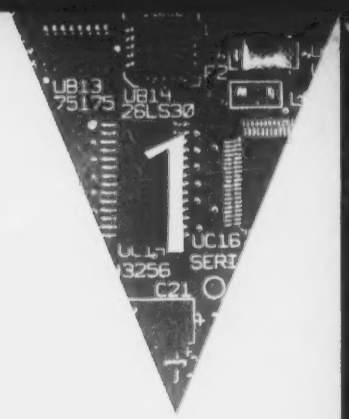




ROLE OF TECHNOLOGY

Management and instructional technology applications and programs can provide vital resources for improving the effectiveness of delivering instructional support services to students in schools. There are six major themes which have been introduced by the Board of Regents in a series of recent policy papers for strengthening the overall effectiveness of instructional support services. The six themes include the following: forging congruence between instructional support services and the core classroom program; managing instructional time to enhance program congruence; generating and monitoring the progress of achieving desired outcomes; program improvement; strategies for organizing instructional support services; and, forging parent partnerships.

A range of technology applications and programs exists which can help teachers and program coordinators implement these themes. For example, computer technology can be used to gather and analyze student data, and to generate reports required for instructional support services. Computer technology can assist in monitoring students' progress in learning and in helping to maintain electronic student records. Technology systems can also help identify students, particularly students at risk or those with unique learning needs. Computer systems can help teachers schedule meetings and allocate time more efficiently. This same technology also offers a way to relieve teachers of administrative burdens associated with paperwork and record keeping, which provides more time for students. Communications systems can enable instructional support staff and classroom teachers to increase communications and efficiently share resources. The use of these systems helps to promote strategies related to congruence. Technology can also be integrated within the curriculum to create new learning strategies targeted for individual student learning needs. Part A, "Technology Support for Instructional Support Services Themes" briefly summarizes each of the six major themes and describes several technology programs and applications that support the implementation of each theme. It should be noted that the ways technology can be used go far beyond basic skills and remedial applications.

Part B, "Context: Role of Technology in the *New Compact for Learning*" is a framework for guiding the use of technology in instructional support programs. The Regents-approved *Long-Range Plan for Technology in Elementary and Secondary Education in New York State* provides several recommendations and suggested initiatives that support strategies recommended in the *New Compact for Learning*. A review of how the recommendations of the *Long-Range Plan for Technology* complement the *New Compact for Learning* is presented.

It should be noted that text boxes are provided where appropriate to refer the reader to detailed descriptions of each of the technology programs. A glossary of terms is provided in the appendix.

A. TECHNOLOGY SUPPORT FOR INSTRUCTIONAL SUPPORT SERVICES THEMES

The following is a review of the six themes and the technology programs and applications that help educators implement each of the themes.

REFER TO:

Long-Range Plan p. 14
TNT p. 57

THEME 1: USING TECHNOLOGY TO PROMOTE CONGRUENCE. In September 1990, the Regents approved a *Policy Paper on the Congruence Between Instructional Support Services and Core Classroom Programs.* The *Long-Range Plan for Technology in Elementary and Secondary Education* (June 1990) includes initiatives that complement the congruence process set forth by the Regents in their policy paper. The statewide Technology Network Ties (TNT) system, which is the platform for implementing the *Long-Range Plan* in schools, provides comprehensive management and instructional services for promoting congruence.

"All schools will ensure that every child has access to and participates in an integrated core program that focuses on common learner outcomes. Specifically, schools must ensure that all students, including those receiving instructional support services, achieve expected knowledge and skill outcomes. Schools will establish support programs as a supplementary extension of the core classroom programs across grade levels, curriculum areas, and all professional support staff with the same purpose, to improve student outcomes."

- Regents Policy Paper on the Congruence Between Instructional Support Services and Core Classroom Programs

Congruence is a process for effectively integrating support services and core programs for students falling behind in school. Congruence is implemented to ensure student success in the core classroom program. Congruence results in an educational plan which specifies the individual learner outcomes that are common to both the core and support programs.

Articulation and coordination are the two major activities which promote congruence. Articulation fosters an alignment of curriculum and instruction; coordination occurs when classroom teachers and professional support staff engage in cooperative planning.

The *Long-Range Plan for Technology* and TNT provide a foundation for using technology to promote congruence. Examples include the following:

REFER TO:

TNT E-Mail p. 61
TNT Conferencing p. 62
Model Schools p. 40

- Access to TNT's PROFS electronic mail and computer conferencing capabilities for increased articulation among all instructional personnel to ensure that the instructional support staff and regular classroom teachers who are responsible for a student's educational program can share the *same* information and resources.
- Access to TNT and school building networks to link classrooms and instructional support services together, ensuring that teaching/learning strategies are shared, developed collaboratively, and well-articulated across a student's entire educational program.
- Use of comprehensive technology planning procedures collaboratively undertaken by all educational staff to ensure that technology is used for integrating instructional programs. The *Technology Planning for Improving Schools* (*TPIS*) model exemplifies this approach.

- Development of comprehensive staff development activities through the Model Schools Program, which trains teachers how to use technology as a tool of instruction. This empowers teachers to develop technology-rich curriculum cooperatively, based upon specified objectives.

Data gathered in the spring 1991 *Survey of the Use of Technology for Instruction in Instructional Support Programs* indicate that over 80 percent of the respondents use computers and other technology applications to promote congruence. The *Long-Range Plan for Technology* and TNT's services expand upon this promising trend by setting directions for the use of technology in the future.

THEME 2: USING TECHNOLOGY FOR MANAGING INSTRUCTIONAL TIME TO ENHANCE PROGRAM CONGRUENCE. In 1990, a series of congruence workshops sponsored by the New York State Education Department and the Association of Compensatory Educators identified four major processes for promoting congruence. These processes and TNT services which support their implementation are as follows:

Strategies for Enlisting Support for Congruence. The development of a shared knowledge of the core curriculum and instructional support service goals and objectives are essential for establishing congruence. Student-centered goals, instructional activities, materials, and an effective evaluation process are the basic procedures for collaborative planning. Instructional support teachers and classroom teachers should participate in the planning process. The sharing of interdisciplinary learning activities is critical.

Organizing for Collaborative Planning. Comprehensive planning procedures should be established which include the need to schedule time for collaborative planning among all members of the educational team. A team of teachers should be assigned a specific population of students, time, and resources to develop effective programs. Through student and teacher grouping, master schedule planning, and efficient use of existing school resources, support instruction in all basic skill areas can effectively take place within the regular classroom.

Finding Time to Collaborate. Time for planning is critical. Strategies for allocating time include freeing teachers from nonteaching duties and scheduling students for special subjects at one time.

Documenting Student Progress. An efficient record-keeping system should be established to document student achievement and determine whether desired outcomes are accomplished.

There are several technology applications and programs implemented within the context of TNT that can help instructional support staff efficiently allocate time for collaborative planning, generate student schedules, and maintain required documentation. For example, TNT's Professional Office System (PROFS) provides teachers with the capability to electronically exchange messages, create calendars, and schedule meetings. This capability can enable teachers to search their individual calendars, locate available time for a meeting, and then schedule all persons for that meeting.

The Student Information System (SIS) provides the data on student needs and achievement that is required for initial planning of the congruence program, scheduling of classes, and generating required reports. SIS provides the capability to register and enroll students, maintain student attendance, record student grades, and generate reports. In New York City, the Student Information System is called Automate the Schools (ATS). The Part 200 Management System for Special

REFER TO:

SIS	**p. 66**
Part 200	**p. 69**
ATS	**p. 67**

Education, which is a component of the overall Student Information System, the computer-based LEAP system, and the New York Student Achievement Tracker (TRACKER) provide management tools for efficient access to student data. The Part 200 Management System maintains biographical, family, and school information on children with handicapping conditions, as well as the capability to generate comprehensive IEPs. The Local Education Agency Programs (LEAP) Evaluation and Reporting System is used for the collection and analysis of evaluation data for categorically aided programs. Individual pupil data reported provide information to enhance instructional management of a program. The TRACKER system provides information on Federal and State compensatory and program evaluation. Information from TRACKER, such as test scores of individual students, student rosters, and lists of teachers providing services, can be shared between instructional support staff and regular classroom teachers to ensure program congruence.

REFER TO:

LEAP	**p. 69**
TRACKER	**p. 69**
CIMS	**p. 72**
TPIS	**p. 28**

The Comprehensive Instructional Management System (CIMS) provides educators with curriculum objectives, assessment procedures for measuring student progress, and lesson strategies. Instructional support staff can access CIMS curriculum objectives in science, social studies, language arts, and mathematics as a basis for planning instructional activities and materials. TNT's *Technology Planning for Improving Schools* (*TPIS*) is a model that instructional support staff can use to forge collaborative support in planning the implementation of technology for promoting congruence.

THEME 3: USING TECHNOLOGY FOR GENERATING AND MONITORING THE PROGRESS TOWARD ACHIEVING DESIRED OUTCOMES. Technology can be used in instructional support services to enable teachers to achieve progress in desired student outcomes. The *1991-1992 Program Guidelines for Chapter 1, PSEN/PCEN, Chapter 2, and Title II* defines desired outcomes as "a Local Educational Agency's (LEA) goals to improve educational opportunities of educationally deprived children so that they (1)succeed in the regular classroom; (2)attain grade level proficiency; and (3)improve in basic and more advanced skills." Figure 1.1 is an extended description of desired outcomes.

"Desired outcomes are a Local Educational Agency's (LEA) goals to improve educational opportunities of educationally deprived children so that they (1)succeed in the regular classroom; (2)attain grade level proficiency; and (3)improve in basic and more advanced skills. Desired outcomes must be expressed in terms that can be measured. At a minimum they must be expressed in terms of aggregate performance, i.e., show improvement in aggregate performance of children over a 12-month period (except preschool, kindergarten, and first grade programs) in basic and more advanced skills that all children are expected to master in an instructional area.

However, to achieve a more complete picture of the success of the Chapter 1 program in its schools, an LEA is encouraged to state other desired outcomes expressed in terms of indicators, such as improved student performance on criterion-referenced tests (CRTs), lower dropout rates, improved attendance, or fewer retentions in grade. All desired outcomes must relate to improved performance in basic and more advanced skills. Each desired outcome must be evaluated by an LEA, using methods appropriate to the way the desired outcome is stated.

A desired outcome statement should contain a

- **goal, or statement of what children should learn or accomplish;**
- **outcome indicator, a measure of success;**
- **standard/performance level, a measure of the level of success that demonstrates substantial progress; and,**
- **time frame to accomplish the above.**

For Grades 2 - 12 in reading and mathematics, each district must express its desired outcomes in terms of aggregate performance. Desired outcomes may be specified for individual grades or grade level groups. Districts are encouraged to state other desired outcomes in addition to aggregate performance outcomes.

The State Education Department strongly urges school districts to establish and pursue goals for aggregate performance that represents a reasonable and respectable standard of excellence."

- Program Guidelines for Federal Chapter 1, State PSEN/PCEN, Federal Chapter 2, Federal Title II, 1991-1992

Figure 1.1. Definition of Desired Outcomes

The development of realistic desired outcomes can be enhanced through the use of technology. Knowing how well students are doing by examining historical or longitudinal data will give the teacher a foundation for establishing realistic goals for student achievement over a specified period of time. The computer-based Student Information System (SIS), under the statewide Technology Network Ties (TNT) system, provides access to a variety of achievement and attendance data. For example, a teacher may wish to establish performance standards based upon the amount of time students participate in a program. SIS will provide the teacher with previous and current attendance data for designing a program for that student. Establishing outcomes and program goals should be based on concrete information.

REFER TO:

SIS **p. 66**

Knowing how many students currently participate in a program coupled with the general performance of students on standardized and State tests, as well as local assessment devices, will enable a district to set priorities for program delivery. SIS allows a district to determine how many pupils are participating in various programs. Additionally, SIS houses the performance data of all pupils. For example, using SIS data helps a district identify programs in need of enhancement. Resources can be appropriately applied to these programs based upon precise student performance data generated by SIS.

Students Receiving Chapter 1 Funds for Reading

11/28/90 **as of 10/10/89 for 1989 - 1990** **Page 7**

School	Grade	Student	Classroom Teacher
ROWS LANE	1	SMITH, DANIEL	
		JONES, LANETRA	
		2 Students Served in Grade 1	
	2	GRAVES, JONATHAN	
		MADER, ROBERT	
		PELLMAN, SHANE	
		LAPE, MATTHEW	
		ROSE, ALICIA	
		HULL, GARY	
		6 Students Served in Grade 2	
	3	DAVIDS, FRANK	
		ALONZO, TOM	
		HINTER, GREGORY	
		NEWCOMB, STANLEY	
		CONLEY, MEAGHAN	
		WILSON, MYLES	
		CONNORS, SHERI	
		7 Students Served in Grade 3	
	6	STACK, JEREMY	
		1 Student Served in Grade 6	
16 Students Served in ROWS LANE			

Figure 1.2. District Report from TRACKER.

By aggregating student achievement data electronically, educators in a building can know in advance of the program application deadline which programs should be continued and which programs need modification. The aggregate performance report can be electronically generated through the LEAP mainframe system, a component of SIS, or through the LEAP TRACKER Program, a microcomputer-based system.

REFER TO:

LEAP **p. 69**
TRACKER **p. 68**

The capability of easily uploading and downloading SIS data allows schools to electronically generate a variety of mandated and special interest reports.

Figure 1.2 is an example of how existing LEAP data residing on a large computer system at a BOCES Regional Information Center were automatically transferred into the microcomputer-based TRACKER Program to produce a district requested report. The capability to electronically transfer the data from a large computer system eliminates duplicative entering of data. Teachers can also efficiently produce a district or building report by using the TRACKER program from their own microcomputer terminal.

Readily available information will make the electronic generation of desired outcomes easy and efficient to produce. Figure 1.3 gives the following format for desired outcomes listed in the *Program Guidelines for Federal Chapter 1 1991-1992.*

1. **The number of Chapter 1 students completing graduation requirements will increase by ____%. Substantial progress will be _____ _____.**

2. **In each Chapter 1 building, the average daily attendance of Chapter 1 students will increase by ____% for this school year. Substantial progress will be _____.**

3. **The number of Chapter 1 students achieving the Statewide Reference Point on the Regent's Competency Test in Reading will increased from ____% to ____% during this school year. Substantial progress will be _____.**

4. **The percentage of children retained in grade 3 will decrease from the current level of ____% to ____% during this school year. Substantial progress will be _____.**

5. **The percent of students scoring above the Statewide Reference Point on State tests will increase by ____%. Substantial progress will be _____.**

6. **The percent of students scoring above the 23 percentile, 35th NCE or 4th stanine on a standardized test in reading and/or math will increase by ____%. Substantial progress will be _____ _____.**

Figure 1.3. Sample Desired Outcomes.

The availability of historic student and school information generated by SIS and simple word processing capabilities will enable instructional support staff to effectively and efficiently complete the statements.

Progress in the Regular Classroom. It is not only important to know how a child is doing in a supplemental service environment, but how the child is performing in the regular classroom. For example, a computer-based Integrated Learning System (ILS) provides teachers with the capability of monitoring student progress throughout specified learning activities. An ILS includes a variety of subjects arrayed by grade and level of

difficulty of subject matter. An ILS also includes testing components and the capability for recording students progress as they move throughout the curriculum presented on the system. The information generated by the ILS system can be used by the teacher to determine the progress of a child's work and where the child is progressing in a current curriculum area. For example, the State Education Department has forged partnerships with industries that produce ILS systems, such as Jostens Learning Corporation and the Teaching and Learning with Computers (TLC) system through a partnership with the IBM Corporation, that offers core, supplemental, and enrichment learning activities. As students progress through the ILS system, the system itself automatically provides remedial and supplemental lessons via the computer system and tracks their performance. A teacher is able to rapidly determine how many times a student has requested help over the system and how long it took to progress through one of the system's major learning activities. The ILS system also reports whether or not a student has attained mastery in a particular area by producing simple student progress reports generated electronically (see Figure 1.4).

REFER TO:

ILS	**p. 22**
JOSTENS	**p. 23**
TLC	**p. 23**

Student: Houghton, Andy **ID: 10634522** **Date: 10/26/90**
Grade: 6 Section: 01 **Page: 1**
Teacher: Rod Kelley
Instructional Interval: 10/05/90 - 10/22/90

Lesson #	Lesson Title	Percent Correct	Min. to Complete	Date Completed
06EM0701	Reviewing Fractions	95	14	10/08/90
06EM0702	Reviewing Decimals to Ten Thousandths	96	12	10/12/90
06EM0703	Comparing Fractions/Decimals	74	20	10/15/90
06EM0704	Reviewing Percents and Percentages	100	15	10/17/90
06EM0705	Investigating Ratios	88	10	10/19/90
06EM0706	Review Unit 7	94	13	10/22/90

Test #	Title	Total Questions	Correct Responses	Percent Correct	Min. To Complete	Date Completed
06EM07080	Test Unit 7	25	14	56	6	10/22/90

Comment: Review Mathematics Unit Test-Student Report

Figure 1.4. ILS Student Progress Report.

All staff involved in a particular child's program can easily access this information over the classroom/building network recommended for implementation in schools in the Regents' *Long-Range Plan for Technology in Elementary and Secondary Education in New York State*. Additionally, the use of technology in this way can foster congruence. For example, if a student was engaged in a learning activity in a science area, then the reading teacher can encourage the child to select reading materials that reinforce concepts learned in the science program because the curriculum is shared over the network.

A basic means of measuring performance in the regular classroom is to look at a student's grades and class ranking. These data are easily accessible through SIS.

Attain Grade Level Proficiency and Obtain Basic and More Advanced Skills. Simply stated, Chapter 1 requires that student performance in reading and mathematics be examined in both basic skills and advanced skills areas. In reading, the advanced skill is comprehension and in mathematics the advanced skill is problem-solving. All other subtest areas, including a total reading and total mathematics score are considered basic skills areas. Initially, Chapter 1 program managers should examine the performance of students on standardized tests. The SIS system can provide subtest data in both reading and mathematics. In addition, with the use of technology systems such as ILSs, a teacher is able to monitor the development of a student's advanced skills rapidly. The ILS system also provides reading comprehension levels.

REFER TO:

Model Schools **p. 40**
Tool Software **p. 74**
CIMS **p. 72**

Newer software enables both the teacher and the student to develop higher order thinking skills. For example, the Model Schools Program provides teachers and students with opportunities for learning new software applications. An application or software "tool" like a word processing program can be used by students to compose or revise reports for all of their subjects. Students sharpen their critical thinking skills as they organize their ideas and express these ideas in alternative ways using a word processing program.

In addition to using technology for enhancing performance in reading and mathematics, TNT's Comprehensive Instructional Management System (CIMS) uses computer technology for tracking student achievement of CIMS science, CIMS social studies, CIMS language arts and CIMS mathematics objectives in speaking, writing, and reading.

Providing students with electronic access to encyclopedias, to other students, to news broadcasts, and to databases through the TNT system gives them an opportunity to improve reading, writing, and research skills in a particular learning environment.

Currently educators are sincerely interested in individual student profiles. Many questions which staff often have can be readily answered using the power of technology. For example, consider having easy access to three pieces of electronically stored information and consider how one could combine the information obtained from CIMS, LEAP and SIS to develop a profile on how a particular student has been and is doing across a variety of subject areas.

Looking at this information in isolation gives a much different picture when the information is combined. In looking only at LEAP data (Figure 1.5) it appears as though the student's math program may not be appropriate due to a decline in the student's test score. However, with further examination of other data it becomes clear that the student was absent for many days (data taken from SIS, Figure 1.6). In addition, the CIMS data (Figure 1.7) demonstrates that the student has achieved mastery in some areas probably due to the fact that the student was present when this material was reviewed. Consequently, it appears as though it is not math that is the problem, but the amount of instructional time the child is receiving.

LEAP

Math	NCE	NCE	NCE
ID	Pre test	Post test	Diff
80 400 629	35.1	32.1	-3.0

Figure 1.5. LEAP Report.

SIS

John Smith - 000 00 000

Number of Days Present - 149

Number of Days Absent - 31

Figure 1.6. SIS Report.

CIMS

STUDENT REPORT
John Smith 000000000

FORM 622 - METRIC MEASURE

OBJECTIVE TITLE	OBJECTIVE NUMBER	PERCENT OF ITEMS MAST. STUDENT STATUS	MASTERY CRITERIA	PRESCRIPTION TITLE
ID APPROPRIATE METRIC UNIT	009100601	+	75%	GOOD YOU MASTERED IT
ADD, SUBT, MULT, DIV METRIC UNITS	009100602	+	75%	GOOD YOU MASTERED IT
SOLVE METRIC PROBLEMS	009100603	38%	75%	_____

PERCENT OF OBJECTIVES MASTERED WAS 66%
NUMBER OF ITEMS CORRECT ON TEST WAS 9 OUT OF 16

Figure 1.7. CIMS Report.

A form could be developed using a word processor and stored in the computer for easy access. Information on students then could be included in this electronic form. This would allow for teachers and administrators to easily identify student and program strengths and weaknesses.

THEME 4: PROGRAM IMPROVEMENT. The March 1991 *Guide to Chapter 1 Program Improvement* includes the requirements for conducting the annual review of effectiveness and the Chapter 1 Program Improvement Plan. Each local educational agency is required to conduct an annual review of the effectiveness of its Chapter 1 project in improving student performance as measured by aggregate performance and the desired outcomes described in their application. A local educational agency is also required to develop and implement, in coordination with the school, a plan for program improvement for each school which served more than 10 students that does not show substantial progress towards meeting the desired outcomes or shows no improvement or decline in aggregate performance of participating children for a 12-month period.

Computer technology and information on students and programs available through TNT can help teachers efficiently develop their required program improvement plans and transmit them in a timely fashion to the State Education Department. For example, the specific format of the program improvement plan can be electronically reproduced by teachers using a word processing program. Required student and program data can then be accessed by the teacher from systems such as the Student Information System (SIS), the Part 200 Management System for Special Education, which is a component of SIS, TRACKER, and the LEAP system. The data which has been accessed can then be transferred into the word processed program improvement plan. When the plan is completed, the document can then be transmitted from the school or district over the TNT network to State Education Department staff responsible for monitoring and evaluating the Chapter 1 program. In a similar way, any suggested revisions or modifications to the program improvement plan could be quickly transmitted back over the TNT network to the district or school.

THEME 5: INTEGRATING TECHNOLOGY WITH STRATEGIES FOR ORGANIZING INSTRUCTIONAL SUPPORT SERVICES. In January 1991, the Regents approved a series of recommendations entitled *Strategies for Organizing Instructional Support Services.* This document contains suggested approaches for providing a range of instructional support services to enhance students' success in the developmental program. Technology is a critical tool for helping teachers and program managers implement the following strategies.

In-Class Co-Teaching Approach. An in-class project provides instructional services for Chapter 1/PSEN/PCEN eligible children within the classroom setting from both the classroom teacher and the support teacher. Instructional support staff work closely with the classroom teacher, who is ultimately responsible for the provision of instructional services to participating children. The project is designed to meet eligible participants' special educational needs. The advantages of this approach are that complex projects can be accomplished and collaboration between classroom and support teachers is increased. Intensive staff development must be provided to ensure continuity between the regular program and the support program.

High School Team Teaching Approach. A major problem today is providing support services in more than one subject at the secondary school level while meeting the increased requirements of the regular curriculum. High schools have employed a team teaching approach to overcome the difficulty of finding time for instructional support services.

As an example, an English teacher and a reading teacher team teach an English class using the regular district curriculum. The class size is reduced to allow for individual instruction. The curriculum has been modified to satisfy State requirements and to provide support services in reading and writing for this particular group of low-achieving students. Teacher schedules include time for collaborative planning.

Preschool Programs. This early intervention approach at the preschool level provides enrichment activities which alleviate the need for supplementary support services later in a student's educational career. Children selected for this program include those children with the greatest need for special assistance. Careful assessment of student needs is a core component of this approach. Sources of information include standard test score data, informal diagnosis, readiness tests, and professional observations.

Reduced Class-Size Approach. In a reduced class-size project, both the developmental and instructional support services are provided to eligible participating students in a small class by the classroom teacher. The class size is reduced to half the size of a regular class for that grade and subject, in order to provide more time for individual attention for the students. Documentation for this support program is maintained by the classroom teacher. Appropriate instructional strategies are creatively developed to address individual student needs.

Add-On Project. An add-on project provides Chapter 1 services at a time when students are not receiving State or locally-funded instructional services. Add-on projects occur during study halls, outside the regular school day, or during summer. The approach involves coordinated planning between the regular teacher and the support teacher. This approach does not require students to miss regularly scheduled classes because it takes advantage of other opportunities for additional supplementary instruction.

Multiple-Funded Approach. A multiple-funded project provides instructional support services for up to one hour per day to eligible students using the classroom teacher in a regular heterogeneous classroom. A rotating teacher or teaching assistant relieves the classroom teacher of responsibility for other students while focusing exclusively on the eligible students. Maintenance of time distribution records is critical to document the actual time spent in providing supplemental instruction.

Pull-Aside Approach (Push In). In-class assistance is provided through a pull-aside program. Students receive instruction from the support teacher in a designated area within the regular classroom. Support instruction is provided to these students while the classroom teacher is also providing small group instruction. The support teacher brings instructional materials to class and stores student folders in the classroom. Simultaneous teaching and learning activities require collaborative planning between the support teacher and the regular classroom teacher.

REFER TO:

SIS	**p. 66**
Part 200	**p. 69**
TRACKER	**p. 68**

The statewide Technology Network Ties (TNT) system, including management and instructional applications, provide invaluable services for implementing the above instructional support strategies. Management applications, such as the Student Information System (SIS), the Part 200 Management System for Special Education, the New York Student Achievement TRACKER, and other services, provide both the support teacher and the regular classroom teacher with information, documentation, and reports for maintaining the needs assessment, student achievement, and record keeping components of these instructional support strategies. For example, SIS provides the capability to register and enroll students, maintain student attendance, record student grades, and generate reports. SIS is a vehicle for recording and tracking the assessment data required for the Preschool Program and the documentation on student performance required for such strategies as the Reduced Class-Size Approach and the Pull-Aside Approach (Push In). The Part 200 Management System for Special Education, in either the stand-alone version or as a component of the larger Student Information System, maintains biographical, family, school information, and comprehensive IEPs that instructional support staff can use to maintain summary and detailed student evaluation information needed for their approaches. The New York Student Achievement Tracker (TRACKER) was designed to provided needed infor-

mation on Federal and New York State compensatory and program evaluation and reporting requirements. Information from TRACKER, such as test scores on individual students, student rosters, and lists of teachers providing services, supports the documentation requirements of these strategies.

REFER TO:

TNT E-Mail **p. 61**
TNT Conferencing **p. 62**

Instructional support services, such as TNT's electronic mail and computer conferencing, provide both the instructional support staff and the classroom teachers with communications and resource sharing capabilities. The team teachers, in the In-Class Co-Teaching Approach and the High School Team Teaching Approach, can use electronic mail and computer conferencing to ensure that there is an ongoing, well-articulated instructional program. Communications can foster congruence.

The Comprehensive Instructional Management System (CIMS) provides educators with a curriculum or set of clearly stated learning outcomes, assessment instruments to measure student progress through the curriculum, a set of teaching/learning strategies, and staff development. CIMS is a model which collaborating instructional support staff and classroom teachers can use to undertake the curriculum revisions required in the Add-On Project, the High School Team Teaching Approach, and the In-Class Co-Teaching Approach. The current use of computer technology in CIMS to generate and store evaluation information can provide these teachers invaluable resources for developing enhanced instructional support services and curriculum.

REFER TO:

CIMS **p. 72**
TPIS **p. 28**
Model Schools **p. 40**
Tool Software **p. 74**

A range of TNT instructional programs, developed in the context of the *Long-Range Plan for Technology in New York State*, can guide the efforts of instructional support staff to develop enriched learning activities in collaboration with regular classroom teachers. For example, the *Technology Planning for Improving Schools* (*TPIS*) approach includes a comprehensive framework for instructional support staff to follow in developing a long-range plan for the use of technology. TNT's Model Schools Program has developed effective staff development activities for training both the instructional support teacher and the regular classroom teacher on the use of tool software within the curriculum. Software tools, such as word processing and databases, can be used to create new learning activities specifically targeted for low-achieving students. Instructional support staff can use a variety of software tools to develop learning activities to actively engage their students' interest.

THEME 6: PARENT PARTNERS. Parents play a pivotal role in their children's education, particularly those involved in instructional support programs. Commitment to parental involvement is a vital part of each Chapter 1 program. The *Program Guidelines for 1991-1992* and the July 1991 Regents policy statement, *Parent Partnerships: Linking Families, Communities and Schools*, provide recommendations for establishing these partnerships.

Specific requirements for parental involvement under Chapter 1 include the following:

- Develop policies for involving parents in the planning, design, and implementation of the Chapter 1 program.
- Provide parents with reports on their children's progress.
- Offer opportunities for regular meetings with parents to ensure their involvement in the program.
- Provide parents of participating children with timely information about the program.
- Increase parental awareness of program requirements.

The parental involvement program includes such activities as training parents to work with their children in the home and to understand program requirements; training parents, teachers, and principals to forge partnerships between home and school; and, training teachers, principals, and other staff to work effectively with parents. One option for increasing parent involvement is to provide parents with access to technology. Home computers can be used by parents so that they may access information regarding homework assignments, school functions, and current student activities. In New York City parents and children both benefit from a take home computer program. Additionally, providing access to computers that are in school to parents has the potential of increasing parent involvement. A current pilot program is being developed in New York City to provide parents access to computers.

The database management systems, research databases, and communications capabilities developed under the Technology Network Ties (TNT) system provide efficient, reliable, and timely tools for assisting instructional support staff in the implementation of the parental involvement program. The Student Information System (SIS), including the Part 200 Management System for Special Education in either the stand-alone computer mode or as a component of SIS, include data on student achievement, comprehensive IEPs, and capabilities for producing reports on individual student progress. These can be transmitted electronically over the TNT network to parents, who would receive home computers as envisioned by the *Long-Range Plan for Technology in Elementary and Secondary Education*. Parents can use their home computers through links to TNT to communicate daily through electronic messaging with instructional support staff. TNT's electronic mail capabilities can also be used to schedule meetings with parents, either individually or as a group. The Youth-At-Risk electronic clearinghouse (YAR) includes electronic mail, computer conferencing, and research databases that could be used both by instructional support staff and parents of participating children to discuss the progress of the program, review requirements, and access research information for future planning.

REFER TO:

SIS	**p. 66**
Part 200	**p. 69**
YAR	**p. 81**

Training in the use of technology for parents and educational staff can be implemented under TNT's Model Schools Program, which provides practical staff development experiences in the use of a range of software tools. TNT's document distribution capabilities will provide parents and instructional support staff shared access to a variety of curriculum documents and objectives such as those developed under the Comprehensive Instructional Management System (CIMS).

In summary, there are currently several technology programs and applications that can help instructional support staff improve the effectiveness of their services. TNT's PROFS system can be used to increase communications, schedule meetings, and allocate time efficiently. A variety of student data accessed through SIS, LEAP, and CIMS can create a meaningful profile of individual student progress. Technology applications can be integrated within the curriculum to strengthen the teaching/learning process in the classroom.

B. CONTEXT: ROLE OF TECHNOLOGY IN THE *NEW COMPACT FOR LEARNING*

Although this chapter focuses primarily on technology applications in instructional support services, this focus should be considered in light of the broader educational directions introduced in the *New Compact for Learning*. The *New Compact for Learning* is a comprehensive strategy to improve public elementary, middle, and secondary education results in the 1990s. "Throughout our society, there is a growing consensus for fundamental changes in the ways we organize and operate elementary and secondary schools — indeed, in the ways we raise and educate our children," stated the document. "What we need for the 1990s is a new approach, one which continues and extends the effective things we are already doing, integrating them with new efforts in a single, comprehensive plan."

Several educational assumptions reside at the core of the *New Compact for Learning* — ranging from the belief that all children can learn to the notion that educational success should be rewarded and deficiencies remedied.

One of the major components of the *New Compact* is the role of technology for improving educational results and effectively preparing children for the future.

The *Long-Range Plan for Technology in Elementary and Secondary Education in New York State*, approved by the Regents in June 1990, provides a vision of the future use of technology in each of the major dimensions of the educational system addressed by the *New Compact for Learning*. The following is a brief review of several of these dimensions.

"The New Compact for Learning must begin and end with students themselves —- students who are curious, questioning, restless, thoughtful, eager to use mind, imagination, and body to investigate something new, ready to do the hard work involved, willing to accept the occasional tedium, increasingly self-directed and self-disciplined. Without such purposeful and responsible activity on the part of students, useful learning will not occur. Without the active engagement of the child, there is no learning. Without the active participation of students, there is no Compact."

- A New Compact for Learning

The Student Dimension. The *New Compact for Learning* emphasizes that students are insatiably curious, adaptive, and eager to learn. As children develop, they maintain the fundamental human drive to understand and master their world. Education must nurture this need by creating an environment where students are actively engaged in learning.

The *Long-Range Plan for Technology* complements this concept of the student as an active, engaged learner by proposing new uses of technology to increase student communications, sharing, collaborative learning, and creative expression. Innovative technology applications provide students with new tools that engage them in the learning experience. Examples include:

- use of student computer workstations in the classroom and at home to enable students to communicate with peers and adults, to share information and products, and to use a rich array of software applications and information resources.

- access to the TNT network for electronic forms of sharing, such as computer-based conferencing and electronic mail, that are independent of location and time.
- linkage to such educational and cultural resources as libraries, museums, and public television resources through networks interconnected to TNT.
- use of multimedia and software tools, such as desktop publishing and graphics programs for supporting student writing, communications, and creative expression.

"In schools as we know them, the quality of children's education depends upon the effectiveness of their teachers. No Compact for Learning can succeed without the active participation of well-prepared, well-supported, well-motivated teachers."

- A New Compact for Learning

The Teacher Dimension. The *New Compact for Learning* strongly emphasizes the vital importance of providing teachers with appropriate resources, collaborative support, and opportunities for professional growth. The *Long-Range Plan for Technology* describes several technology applications and programs that support teachers and enable them to create a supportive learning environment for their students. Examples include:

- full participation in planning and implementation of all technology programs and services.
- use of a teacher computer workstation at school and at home to provide access to management resources, student information, instructional applications, communications, and resources for enriching the learning environment.
- access to the TNT network for communications with students, parents, and colleagues in the building, district, community, region, state, and the world.
- provision of comprehensive staff development programs, such as Model Schools, which empower teachers to use current and future technology.

"Strong leadership is vital to an effective school. The principal sets the tone; by encouraging teamwork and collaboration, by welcoming participation of parents and community members in the life of the school, by monitoring the performance of teachers and other members of the school staff, and above all, by expecting steady progress and high achievement of all pupils, the principal plays a key role in the New Compact for Learning.

Just as the principal sets the tone for a school building, the superintendent must coordinate the creation of a shared vision for the school district."

- A New Compact for Learning

The Administrator Dimension. The *Long-Range Plan* recommends technology initiatives that will provide administrators with management resources and tools for exercising the leadership emphasized in the *New Compact*. Two examples are:

- the use of an administrative computer workstation that provides access to a full complement of fiscal, personnel, and student information functions, and
- the availability of valid and reliable program information and communications for guiding decisions.

"Individual schools should be as autonomous as feasible within a context of shared purpose and support. As many operating features as feasible must be made by the principal, the teachers, the other staff members, and the parents whom the school unit comprises. These people should of course be open to ideas and help from others, but they must within reasonable limits enjoy the freedom and authority to do things in ways which make sense to them. 'Site-based decision making' is not just a contemporary fad; it is a sound and enduring principle of institutional effectiveness."

- A New Compact for Learning

The School. The *Long-Range Plan* proposes recommendations to provide the school with resources for shaping institutional change and direction.

- Fully networked classrooms and school library media centers with access to educational and cultural networks beyond the building.
- Curriculum-based technology plans, as guided by the *Technology Applications for Improving Schools* (*TPIS*) approach.

Other dimensions addressed by the *New Compact* and supported by the *Long-Range for Technology* are briefly identified in Figure 1.8.

Dimension	New Compact for Learning	Long-Range Plan for Technology
District	Set objectives/standards; provide resources; develop programs with better results.	Fiscal support for implementing technology.
Community	Strengthen collaboration between education and the wider community.	Collaborative support of parents, taxpayers, and institutions for technology.
Region/State	Forge linkages between schools, BOCES, regional institutions, and the State.	Provide a comprehensive TNT system, including reporting systems and funding strategies. to improve educational results.

Figure 1.8 Technology Support for *New Compact* Dimensions

Summary.

Chapter 1 discusses how technology can be used for supporting six major instructional support services themes. These themes, and the technology programs for supporting them, are as follows:

1. Using technology to promote congruence: TNT's electronic mail and computer conferencing capabilities can increase articulation between the core program and instructional support services.

2. Using technology for managing instructional time to enhance program congruence: TNT's messaging and calendar system help instructional support staff locate available time and schedule meetings.

3. Using technology for generating and monitoring the progress toward achieving desired outcomes: SIS, TRACKER, the LEAP System, and CIMS reports provide meaningful profiles of student achievement.

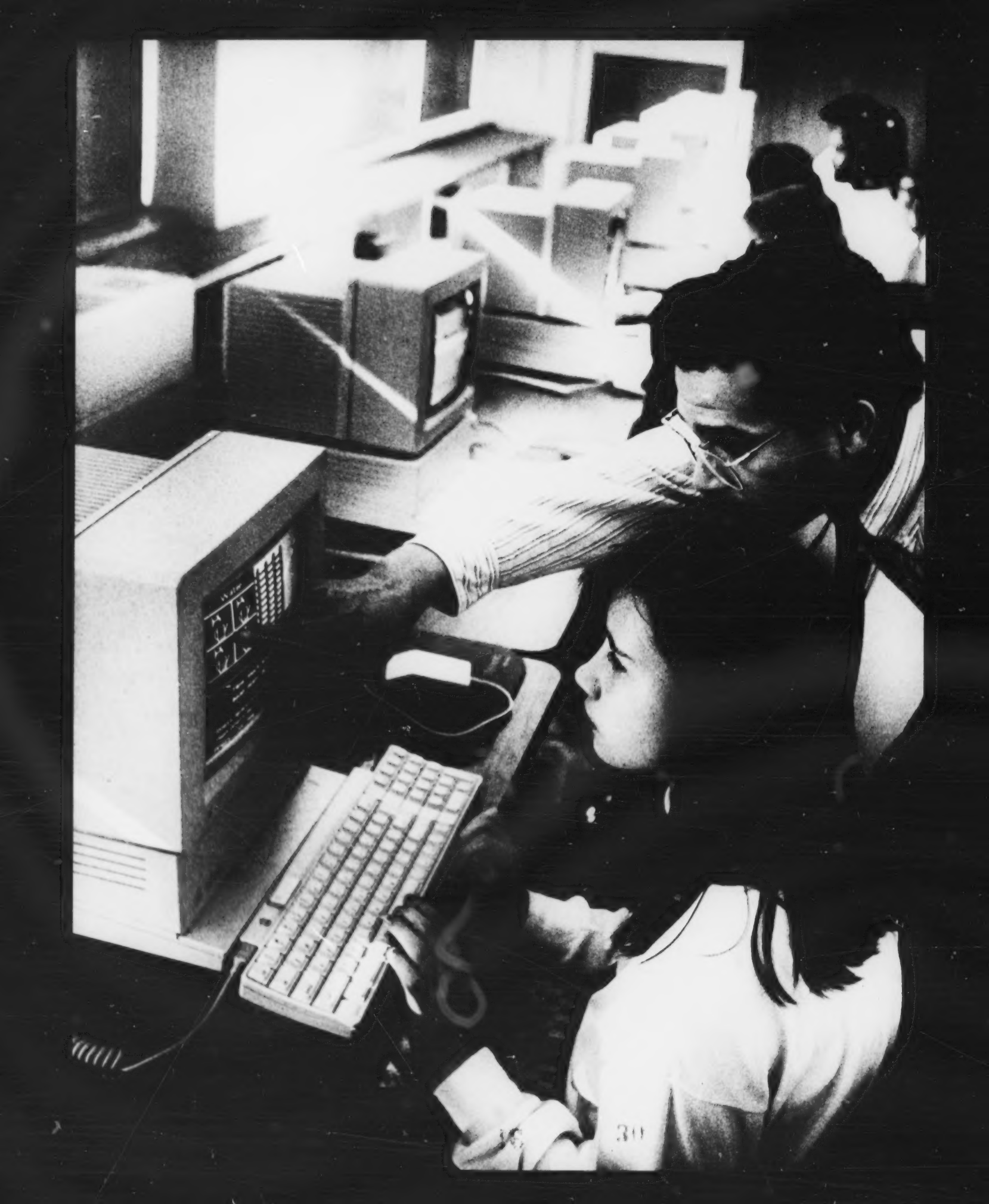
4. Program improvement: a Program Improvement Plan can be created using word processing that incorporates data on student performance for transmission over the TNT network.

5. Integrating technology with strategies for organizing instructional support services: CIMS objectives, student data available from SIS, the *Technology Planning for Improving Schools* (*TPIS*) model, and the Model Schools Program represent some of the applications for supporting instructional support strategies.

6. Parent partners: a New York City initiative in which parents were provided a computer for use at home exemplifies the role of technology in increasing collaboration between parents and school.

Chapter 1 concludes with a review of the role of technology in supporting the *New Compact for Learning*. The *New Compact* represents a foundation for guiding the integration of technology in the teaching environment.

As will be seen in Chapter 2, schools are beginning to use a variety of technology applications in their instructional support programs.



CURRENT STATUS OF TECHNOLOGY IN INSTRUCTIONAL SUPPORT SERVICES

The State Education Department and representatives of the New York State Association of Compensatory Educators' Technology Committee designed a building-level survey in February 1991 to gather information on the uses of computer technology in instructional support programs. The survey was distributed to 1,508 schools in late March 1991. The buildings targeted for the survey formed two groups: 531 buildings selected because they indicated, via the Local Education Agency Programs Reporting and Evaluation System (LEAP), that technology was used in the education of pupils in instructional support programs, and 977 buildings in the "Big Five" City School Districts that were not in the LEAP group.

The completed surveys were returned in mid-April 1991. As of May 15, 1991, there were 740 surveys (49 percent) returned. Of this number, 552 buildings indicated that computer technology was used for instruction in instructional support programs. For this survey, instructional support programs included Chapter 1, PSEN/PCEN, and local remedial efforts. The distribution of these buildings in urban sites and throughout the rest of the state is as follows: New York City (46 percent); Syracuse (8 percent); Yonkers (2 percent); and the rest of the state (43 percent). All data results reported are based upon this total number of 552 buildings. The results are organized according to the sequence of questions in the survey.

Students.

More than 125,000 students in instructional support programs use computer technology for instruction. There is a fairly even distribution of these students for grades 1 through 8, although the majority are in grades 9 (17 percent) and 10 (15 percent). Figure 2.1 illustrates the distribution of these students across grade levels (K-12). Table 2.1 provides the data displayed in the figure.

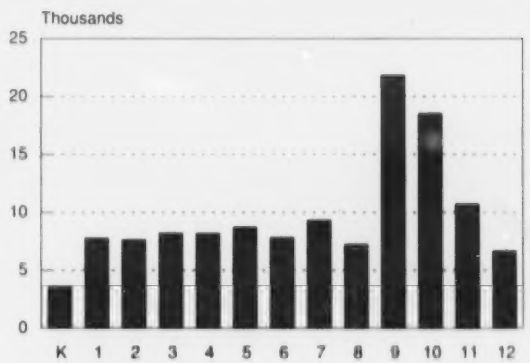


Figure 2.1. Number of Students Using Computer Technology for Each Grade, K-12 (total N=125,433).

Gr.	Students	Gr.	Students
K	3,566	7	9,252
1	7,730	8	7,163
2	7,579	9	21,755
3	8,152	10	18,460
4	8,124	11	10,636
5	8,662	12	6,585
6	7,769	Tot.	125,433

Table 2.1. Number of Students Using Computer Technology for Grades K-12.

Subject Areas.

Computer technology is most frequently used in instructional support programs in the subject areas of writing, language arts, reading/writing, reading, and mathematics. Computer technology is less frequently used in bilingual education, social studies, science, and English as a Second Language. Figure 2.2 shows the number of buildings using computer technology in instructional support programs for each subject area. Table 2.2 provides the specific data results displayed in the figure.

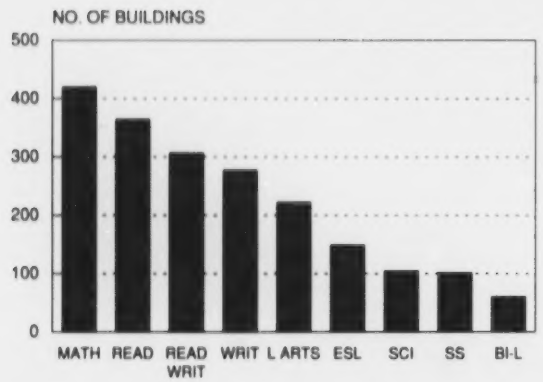


Figure 2.2. Number of Buildings Using Computer Technology Education in Selected Subject Areas (total N=55).

Subjects	Buildings	Subjects	Buildings
Math	419	Reading	363
Read/Write	305	Writing	276
L. Arts	221	ESL	148
Science	104	Social S.	101
Bilingual	60		

Table 2.2. Number of Buildings Using Computer Technology in Selected Subject Areas.

Location.

Buildings surveyed were asked to indicate the number of students in instructional support programs using each of the following technology configurations: (1) the use of a computer lab only; (2) the use of a classroom computer(s) only; and, (3) the use of both a lab and classroom computers (see Figure 2.3). The most frequently used technology configuration is the computer lab (over 48 percent). Table 2.3 provides the specific data results illustrated in Figure 3.

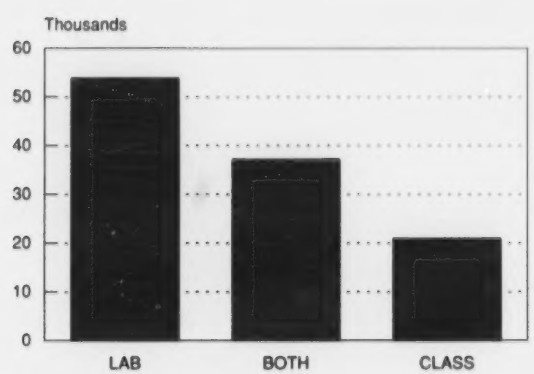


Figure 2.3. Number of Students Using Selected Technology Configurations.

Configuration	Students
Computer Lab Only	53,822
Both	37,084
Classroom Computer	20,817

Table 2.3 Number of Students Using Selected Technology Configurations.

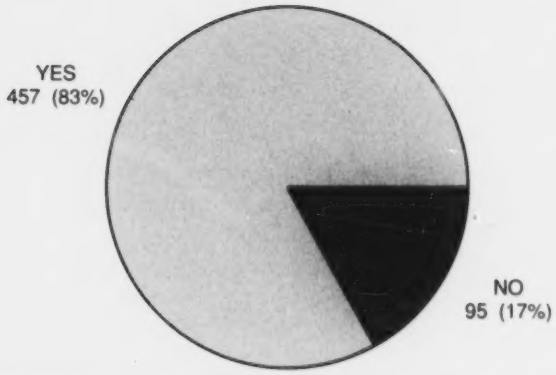


Figure 2.4. Number of Buildings Using Computer Technology for Promoting Congruence Between the Instructional Support Program and the Regular Program (total N=552).

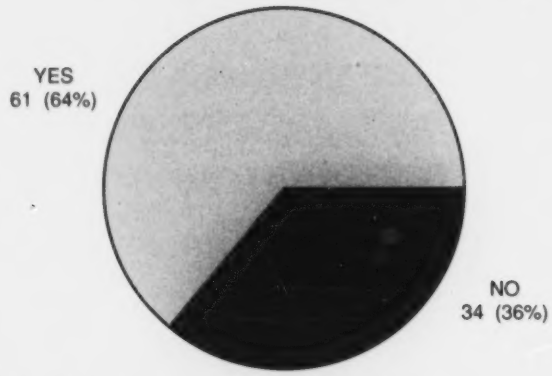


Figure 2.5. Number of Respondents who Believe Technology could Foster Congruence Between the Instructional Support Program and the Regular School Program (total N=95).

Fostering Congruence.

A substantial majority of school buildings (83 percent) indicated that computer technology was used to promote congruence between their instructional support program and the regular school program (see Figure 2.4).

The respondents who indicated they were not using computer technology to promote congruence between the instructional support and regular school programs were asked to indicate if they *believed* technology could promote congruence. A majority of these respondents (64 percent) believed that technology could be used to foster congruence between the instructional support program and the regular school program (see Figure 2.5).

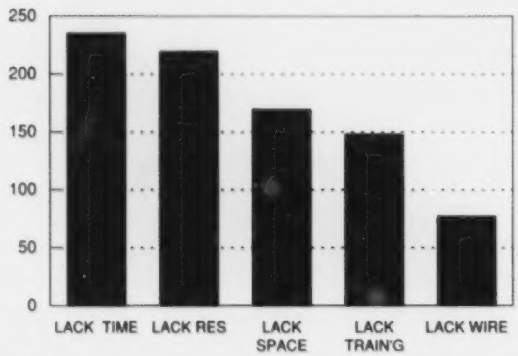


Figure 2.6. Major Impediments to Using Computer Technology to Assist the Instructional Support Program in Supporting the Regular School Program (total N=552).

Impediments.

Some of the major impediments to using computer technology to assist instructional support programs in supporting the regular school program are inadequate resources, time, space, wiring, and training (see Figure 2.6).

Electronic Mail.

There are very few students in instructional support programs using electronic mail (e-mail) for communications with other students. Figure 2.7 shows the number of buildings in which students in instructional support programs are using electronic mail.

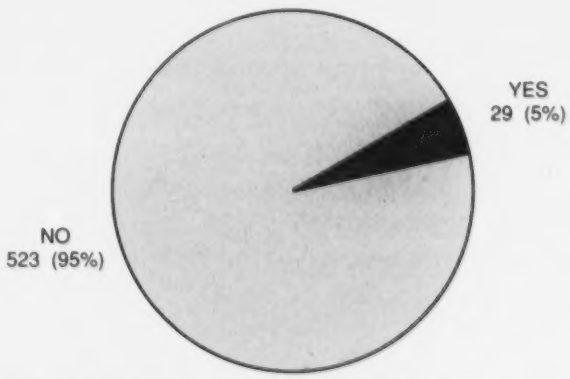


Figure 2.7. Number of Buildings Indicating that Students Use E-Mail (total N=552).

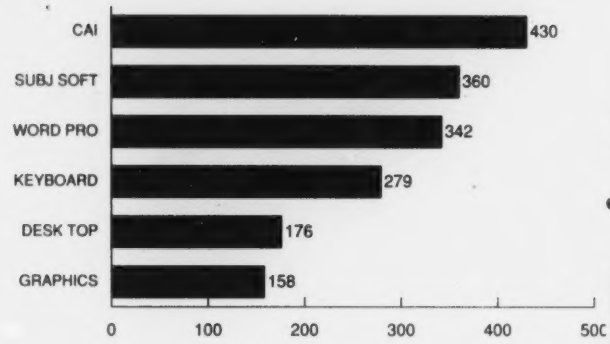


Figure 2.8. Distribution of the More Frequently Used Computer Applications in Instructional Support Programs (total N=552).

Most Used Applications By Site.

The instructional computer technology applications most frequently used in instructional support programs are as follows:

Figure 2.8 shows the number of buildings using each of these computer applications in instructional support programs (see accompanying legend).

APPLICATIONS	% SCHOOLS
Computer Assisted Instruction	**78**
Subject Specific Software	**65**
Word Processing	**62**
Keyboarding	**51**
Desktop Publishing	**32**
Graphics	**30**

KEYBOARD	=	**Keyboarding**
CAI	=	**Computer Assisted Instruction**
ILS	=	**Integrated Learning System**
WORD PRO	=	**Word Processing**
DESK TOP	=	**Desktop Publishing**
D BASE	=	**Database Applications**
EL ENCY	=	**Electronic Encyclopedia**
SPREAD S	=	**Spreadsheets**
GRAPHICS	=	**Graphics/Illustrations**
COMP SIM	=	**Computer Simulations**
CAD	=	**Computer Assisted Design**
MULTI M	=	**Multimedia Applications**
SUBJ SOFT	=	**Subject Specific Software**
ONLINE D	=	**On-Line Databases**

Legend for Figures 2.8 and 2.9.

Least Used Applications By Site.

The instructional computer technology applications used less frequently in instructional support programs are integrated learning systems, database applications, electronic encyclopedia, spreadsheets, computer simulations, computer-assisted design, multimedia, and on-line databases (see Figure 2.9 and accompanying legend).

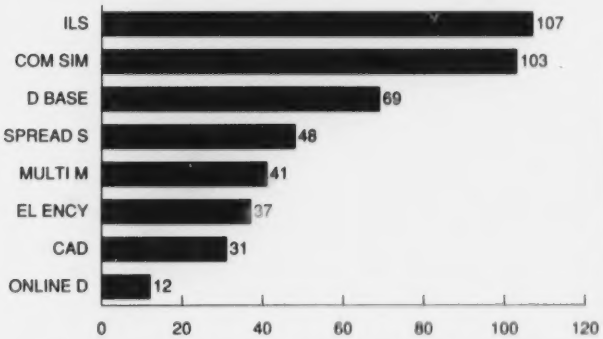


Figure 2.9. Distribution of Less Frequently Used Computer Applications (total N=552).

Integrated Learning Systems (ILS).

The percent of schools using specific integrated learning systems in their instructional support programs are shown below.

SYSTEMS	% SCHOOLS
Writing to Read	**15**
ISI/CCC	**13**
Jostens	**6**
Optical Data	**4**
Plato	**4**
Classwork Learning System	**3**
Ideal Learning	**3**

Figure 2.10 shows the distribution of these frequently used integrated learning systems in instructional support programs (see accompanying legend).

The most widely used systems in instructional support services are the Instructional Systems Inc./Computer Curriculum Corp. system and the IBM Corporation Writing to Read system. These are computer-based, integrated curriculum learning systems that have been available for many years.

W TO R	=	**IBM Writing To Read System**
ISI/CCC	=	**Instructional Systems Inc./ Computer Curriculum Corp.**
JOST	=	**The Basic Learning System of Jostens Learning Corporation**
OPT DAT	=	**Optical Data Corporation System**
PLATO	=	**Plato System**
CNS	=	**Class Work Learning System**
ILC	=	**Ideal Learning Corporation System**

Legend for Figure 2.10.

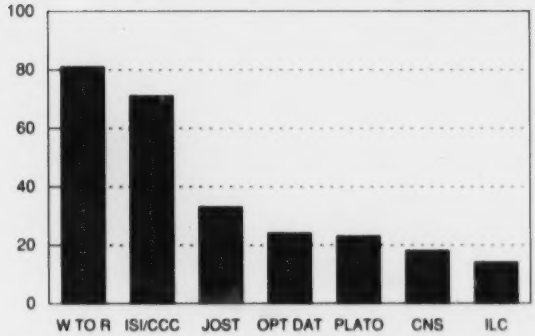


Figure 2.10. Number of Buildings for Integrated Learning Systems Used in Instructional Support Programs (total N=55).

Other integrated learning systems used in instructional support programs are illustrated in Figure 2.11 (see accompanying legend).

Many of these systems have recently been introduced into the educational marketplace and consequently are not as widely used as systems like ISI/CCC and Writing to Read.

VALE	=	**Voy a Leer Escribiendo**
PALS	=	**Principle of the Alphabet Literacy System**
WICAT	=	**WICAT System**
TLC	=	**Teaching & Learning With Computers**
ABC	=	**ABC News Interactive**
AT&T	=	**AT&T Learning Network**
NAT GEO	=	**National Geographic Kids Network**
GTE	=	**World Classroom**

Legend for Figure 2.11.

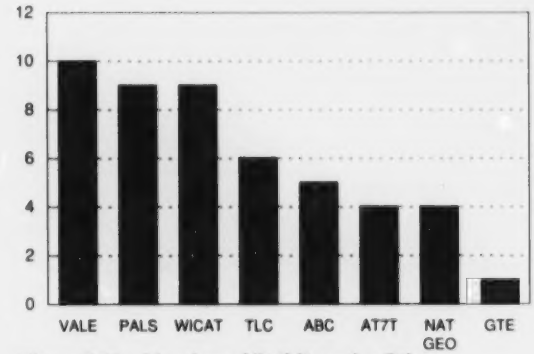


Figure 2.11. Number of Buildings for Other Integrated Learning Systems Used in Instructional Support Programs (total N=552).

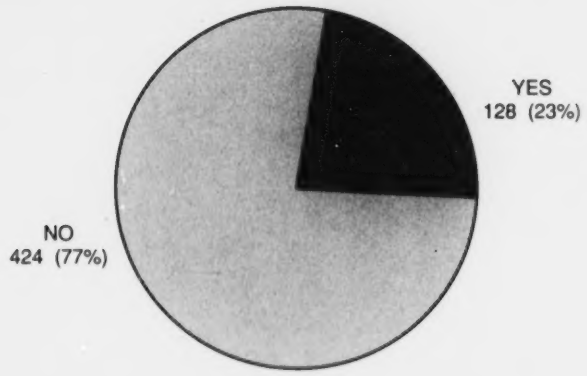


Figure 2.12. Number of Buildings with a Formal District Plan for the Use of Technology in Instructional Support Programs (total N=552).

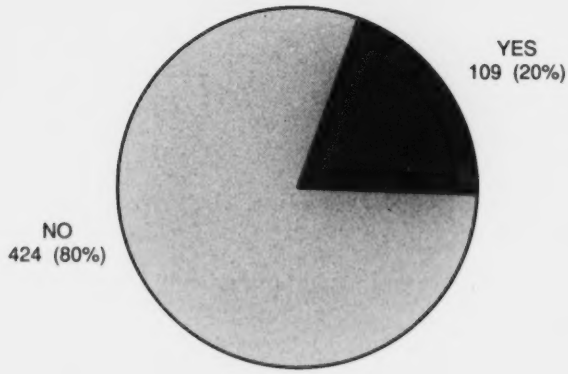


Figure 2.13. Number of Buildings with a Formal Building Plan for the Use of Technology in Instructional Support Programs (total N=552).

Planning.

Of the buildings surveyed, 23 percent reported that their districts possessed a formal written plan for the use of technology in instructional support services (see Figure 2.12). Twenty percent indicated that their building had a formal technology plan (see Figure 2.13).

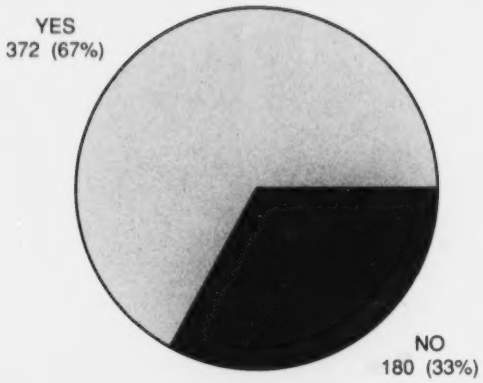


Figure 2.14. Number of Buildings with a Technology Staff Development Program for Teachers (total N=552).

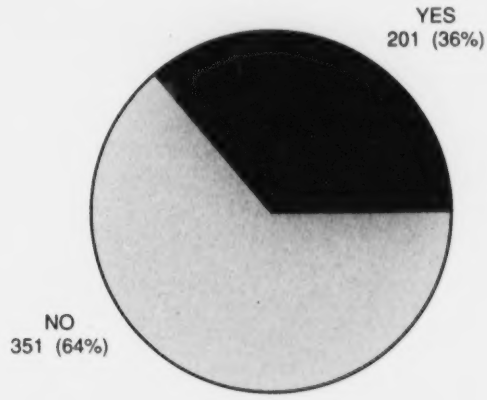


Figure 2.15. Number of Buildings with a Specific Technology Staff Development Program for Instructional Support Staff (total N=552).

Staff Development.

Sixty-seven percent of the respondents indicated there is a general staff development program for the instructional use of computer technology by teachers in their buildings (see Figure 2.14).

Thirty-six percent of the respondents indicated there is a specific staff development program in the instructional use of computer technology for instructional support staff in their buildings (see Figure 2.15).

Sources of Training.

Figure 2.16 designates the sources of training provided to implement the instructional use of computer technology in instructional support programs at the building level (see accompanying legend).

As shown in Figure 2.16, the major providers of technology staff development for instructional support staff are school districts (68 percent), Technical Assistance Centers (31 percent), vendors (29 percent) Teacher Resource and Computer Training Centers (27 percent), and BOCES (22 percent).

DISTRICT	=	**In-district Program**
TAC	=	**Technical Assistance Center**
VENDOR	=	**Hardware/Software Vendor**
TRCTC	=	**Teacher Resource Center**
BOCES	=	**Bds. of Coop. Ed. Svs.**
NYC ED BD	=	**NYC Cen. Bd. of Ed.**
COLLEGE	=	**Postsecondary Institution**
ASSOC	=	**Prof. Assoc.**
SED	=	**State Education Department**

Legend for Figure 2.16.

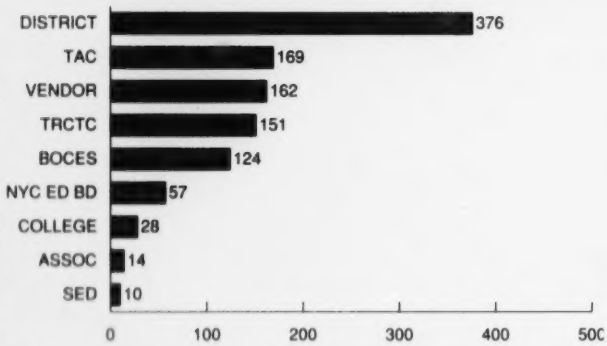


Figure 2.16. Number of Buildings Receiving Training for the Sources Indicated (total N=552).

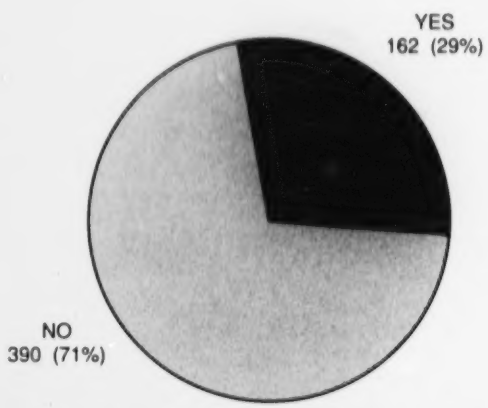


Figure 2.17. Number of Buildings Receiving Training for the Sources Indicated (total N=552).

Promising Programs.

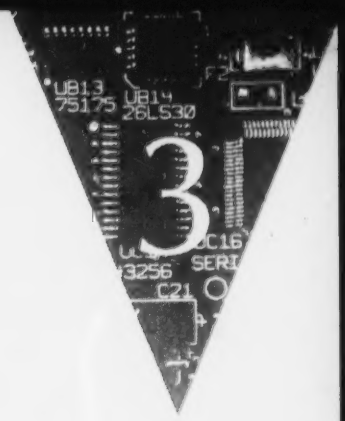
Figure 2.17 shows the number of buildings that indicated they have a promising computer technology application or program for students in instructional support programs.

Summary.

Chapter 2 reported on the results of the February 1991 *Survey of the Use of Technology for Instruction in Instructional Support Programs*. Major highlights of the survey are as follows:

- Over 100,000 students are using computer technology in instructional support programs.
- The major technology configuration used is a computer lab in a school building.
- Over 80 percent of the respondents indicate they are using technology to promote congruence between instructional support services and the regular school program.
- The major impediments to using technology are inadequate resources, time, space, wiring, and training.
- The most used software applications are computer assisted instruction, subject specific software, and word processing.
- The integrated learning systems in greatest use are IBM's Writing to Read program and Instructional Systems Inc./Computer Curriculum Corporation's program.

These results represent a profile of current uses of technology in instructional support programs. The results are a critical foundation for the statewide planning of future technology applications and programs.



PLANNING

"The Monroe-Woodbury School District is successfully meeting its technology curriculum objectives with a computer instructional program. For the past 10 years, the district's emphasis on conscientious planning has been the foundation for the building of their technology program. The planning elements which the district relies upon are: well-defined goals and objectives; cooperative planning and evaluation; personnel considerations; an articulated program; and appropriate facilities. These planning elements have also been incorporated into the planning process for computer curriculum integration.

`We have always believed that the computer should not be the focus of instruction, but rather the tool that helps students focus on the other subject areas and the learning process,' said Anthony Sorrentino, Director of Computer Instruction. 'We are presently in our third Long-Range Computer Plan and are already anticipating future changes.'

Monroe-Woodbury developed one computer integration committee at the high school, one at the middle school, and another at the elementary school level. Each committee is comprised of classroom teachers, computer teachers, and administrators. This committee planning process has been highly successful in Monroe-Woodbury."

- Anthony Sorrentino, Monroe-Woodbury Central School

Results of the spring 1991 *Survey of the Use of Technology for Instruction in Instructional Support Programs* indicate that few school buildings currently have either a formal district or building plan for the use of technology in instructional support programs. Only 23 percent of the buildings surveyed have a district plan and only 20 percent have a building plan (refer to Chapter 2 for a review of the survey results).

The development of a comprehensive planning process, however, is critical for guiding the effective use of technology in instruction. At the initial stage of the technology planning process, there are basic questions which should be addressed by a representative committee of administrators, teachers, other educational staff, and parents. Answers to these questions serve as a basis for developing a formal district or building long-range technology plan. These specific questions are as follows:

1. What are the instructional goals and objectives that the district intends to accomplish?
2. Is the committee responsible for developing a formal technology plan representative of all district and community members?
3. What hardware and what instructional software will be acquired?
4. Are the software programs selected consistent with the learning outcomes of the district's core program?

5. How will technology, the instructional support program and the core program be integrated?
6. What type of staff development program will be developed to ensure that administrators, teachers, and students are able to use the technology?
7. Is this preliminary plan for technology consistent with the Regents-approved *Long-Range Plan for Technology*?
8. Has the necessary planning occurred with either BOCES Regional Information Centers or the New York City Board of Education for schools in New York City to establish connection to the statewide TNT network?

These questions establish a framework for beginning a formal technology planning process. The questions were the basis for the development of the *Technology Planning for Improving Schools* (*TPIS*) process.

This chapter includes an abstracted version of *TPIS* because this comprehensive planning process can be used effectively by instructional support staff to develop strategic directions for technology use and staff development in their programs.

TECHNOLOGY PLANNING FOR IMPROVING SCHOOLS (TPIS): AN ABSTRACT. The *Technology Planning for Improving Schools* (*TPIS*) model incorporates elements of strategic and program planning with a special focus on linking current and future technologies to district and school improvement priorities in instruction. *TPIS* helps school districts improve their use of technology through the design and implementation of a comprehensive technology plan that is linked to the district's overall school improvement efforts. *TPIS* addresses not only the development of a plan, but also the application of an ongoing planning process. *TPIS* helps schools establish a technology planning process that will ultimately change the way they use technology to support school and program improvement.

The *TPIS* approach recommends that planning for the development of the technology support system be an integral component of district-wide school and program improvement planning. Technology planning that is unconnected to the improvement process runs the risk of creating technology applications that operate at the periphery of the organization. Similarly, if school and program improvement planning is conducted without attention to the integration of technology, such planning is likely to result in curriculum and instruction which does not adequately prepare students for employment in the real world.

TPIS employs three planning levels:

"The Guilderland Central School District, located in Albany County, promotes strategic planning as an integral component of the successful application of technology at all grade levels. Planning for technology coincides with curriculum planning, permitting revisions to occur both in curriculum and technology in an ongoing fashion. This interplay has resulted in a rich exchange of information through the shared decision making model which promotes communication with faculty, staff, and administration.

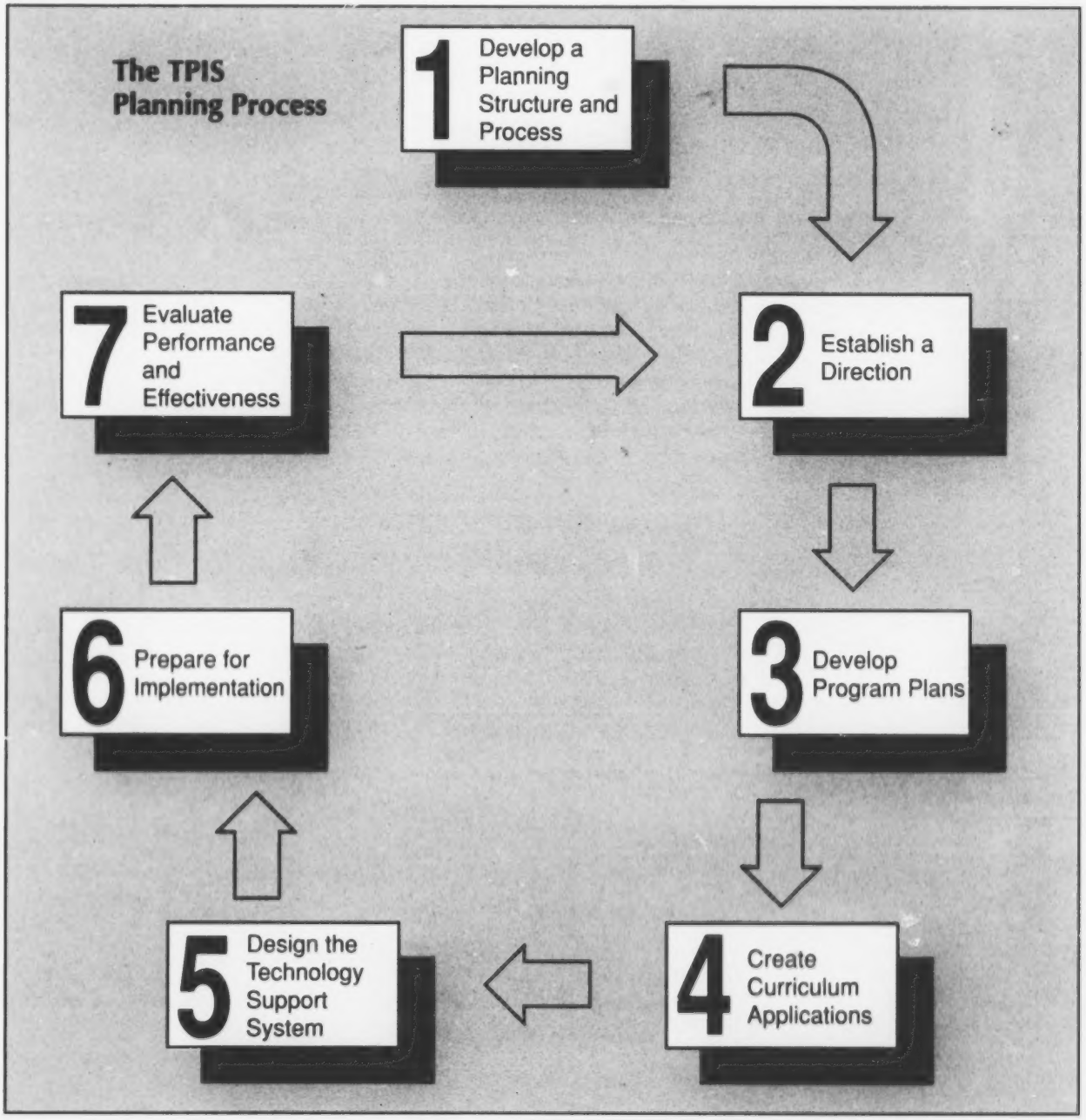
The District-wide Technology Committee, supported by members of the building-level technology teams, exchanges information with the various curriculum and building-level cabinets. This process insures that ideas generated by teachers, parents, administration, and staff can be heard. This information exchange has produced dramatic applications of technology across the district which focus on the curriculum. Currently, program development is directed towards a long-range vision, and the ongoing revision of a long-range plan which incorporates the Technology Planning for Improving Schools (TPIS) model."

- Andrew DeFeo, Guilderland High School

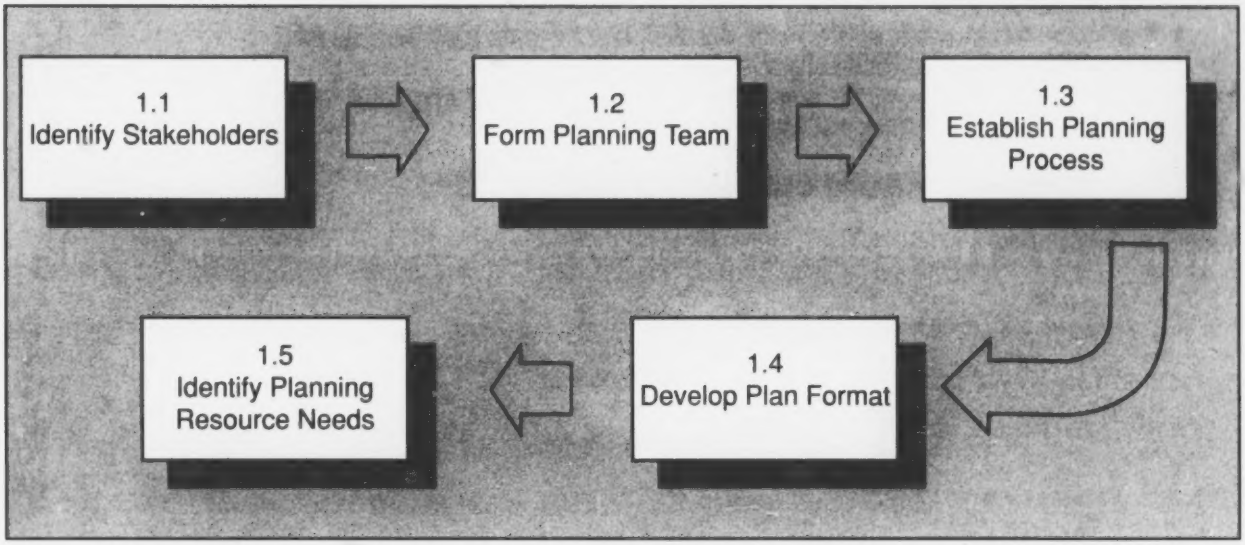
- Strategic planning establishes the overall direction for school and program improvement.
- Program planning translates the broad direction into program plans focused on priorities for development and improvement.
- Curriculum planning specifies how technology applications are integrated into the curriculum and teaching and learning process.

TPIS translates these processes into seven major tasks (see Figure 3.1).

Figure 3.1. *TPIS* Tasks.

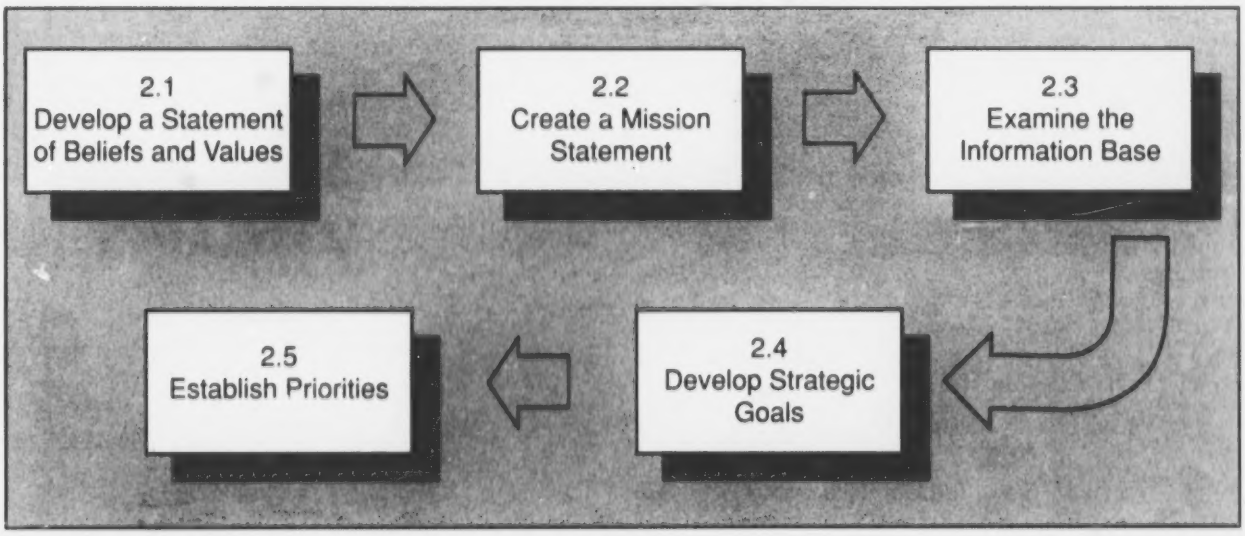

The TPIS Planning Process
1 Develop a Planning Structure and Process
2 Establish a Direction
3 Develop Program Plans
4 Create Curriculum Applications
5 Design the Technology Support System
6 Prepare for Implementation
7 Evaluate Performance and Effectiveness

TASK 1. DEVELOP A PLANNING STRUCTURE AND PROCESS.



Task 1 addresses the procedures for establishing a district-wide planning process and creating an organizational structure for developing and implementing the plan. Many planners overlook one of the principal benefits of planning: the involvement of key stakeholders. Planning is an ongoing process: its focuses as much on creating a learning community and developing a consensus about mission and goals as it does on preparing a document. The process requires district leadership to commit to a continuing renewal of plans and programs.

TASK 2. ESTABLISH A DIRECTION.



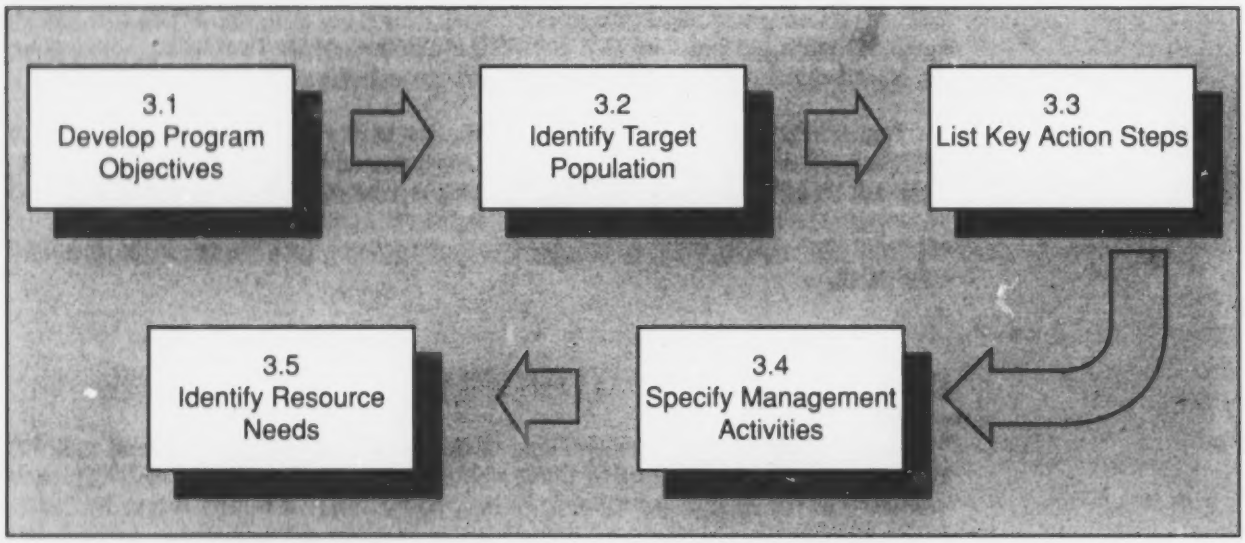
Establishing a strategic direction for the technology support system requires the district to determine where it is now and where it wants to be in the future. This requires

the development of:

- a statement of beliefs and values (philosophy);
- a mission stating the major purpose of the school;
- an information base to support decisions about new directions and program improvements; and,
- a course of action, including goals and priorities for program improvement.

Each of these elements should include references to the role of technology in curriculum and instruction. Strategic planning helps a district create a better match between the technology support system and district improvement priorities. Planning also helps the district assess its internal strengths and weaknesses, and make decisions about broad directions for development and improvement. The process extends beyond traditional needs assessment to examine the larger context in which those needs exist focusing on opportunities to be pursued and problems to be solved.

TASK 3. DEVELOP PROGRAM PLANS.

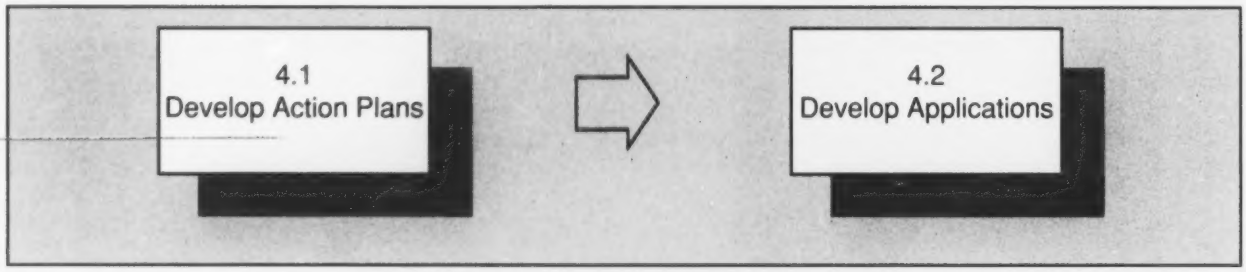


Program planning translates the strategic direction established in Task 2 into detailed plans which addresses the goals and priorities established through the strategic planning process. A program plan has the following components:

1. Objectives
2. Target population
3. Action steps
4. Management requirements
5. Staff
6. Staging and phasing
7. Facilities
8. Resource requirements.

In school and program improvement, most program objectives focus on broad student learning outcomes. These broad outcomes are translated into specific student learning outcomes as part of the curriculum development process in Task 5. Since the focus of the *TPIS* process is on curriculum-based technology applications, program planning sets the stage for new developments or improvements that will be supported by a technology support system.

TASK 4. CREATE CURRICULUM APPLICATIONS.



The key process in this task is to develop instructional unit plans. The benefits of the *TPIS* process are realized through integrated instructional units. When technology applications are blended with essential skills in the curriculum, there is the potential for using the technology as a catalyst to transform curriculum and teaching and learning.

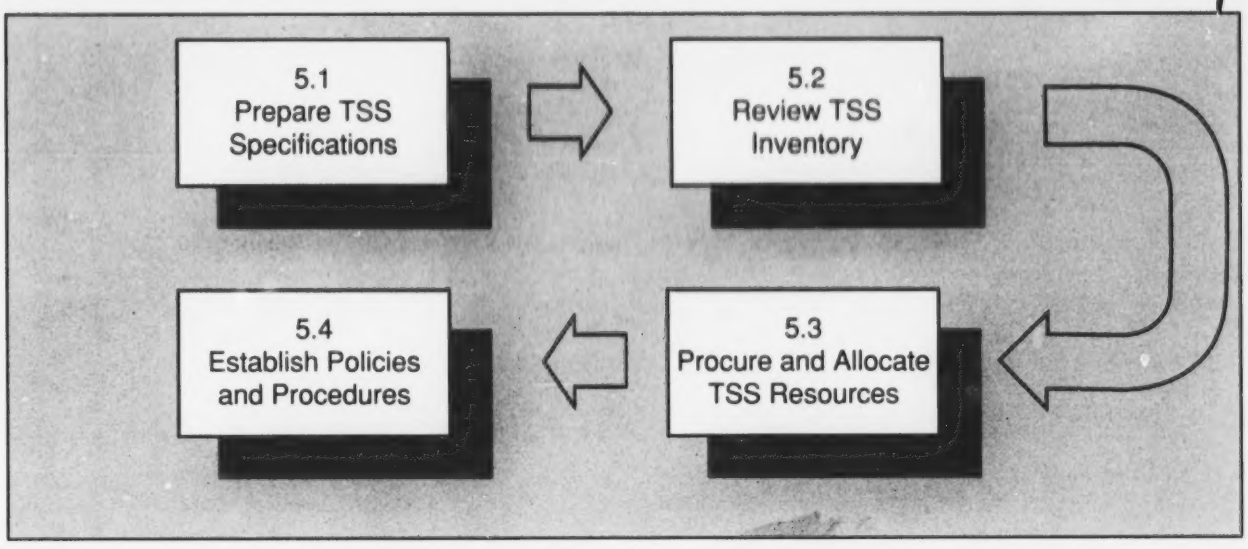
The instructional unit plans and other aspects of the curriculum development process need to be developed by teams of teachers and technology resource persons. They can identify the major changes they want to take place in learning outcomes and processes. The technology support system staff must assist the curriculum development committees, helping them to integrate technology applications in curriculum and instruction.

TASK 5. DESIGN THE TECHNOLOGY SUPPORT SYSTEM.

A technology support system (TSS) is an interrelated set of human and material resources and processes directed to the accomplishment of program objectives. It is important to conceive of the technology support system as a means, not as an end in itself. The development of the technology support system is nested within program and curriculum planning. The design of the technology support system is central to the planning process and the importance of developing a comprehensive system.

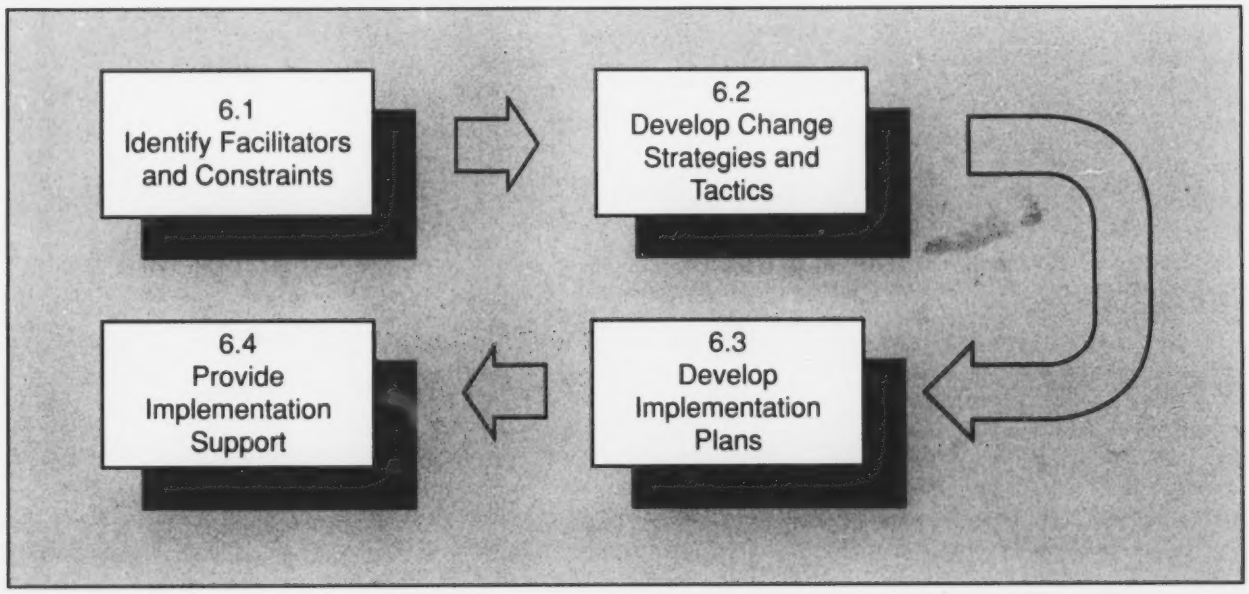
The technology support system includes the following components:

1. Human resources
2. Equipment
3. Communications
4. Software
5. Materials
6. Facilities and space
7. Policies and procedures.



TASK 6. PREPARE FOR IMPLEMENTATION.

There are two levels of change: institutional and individual. In almost every instance of planning where a shift in planning is required, organizations tend to focus their efforts and resources on institutional change. However, *individual change* is the most important focus. Unless individuals are helped to change, no shift will occur and the organizational change will dissipate. Thus, research suggests there are two major areas of focus in effective staff development: (1) how people change in their feelings about and use of new programs, and (2) what processes and characteristics of individuals and settings help or impede the change process.



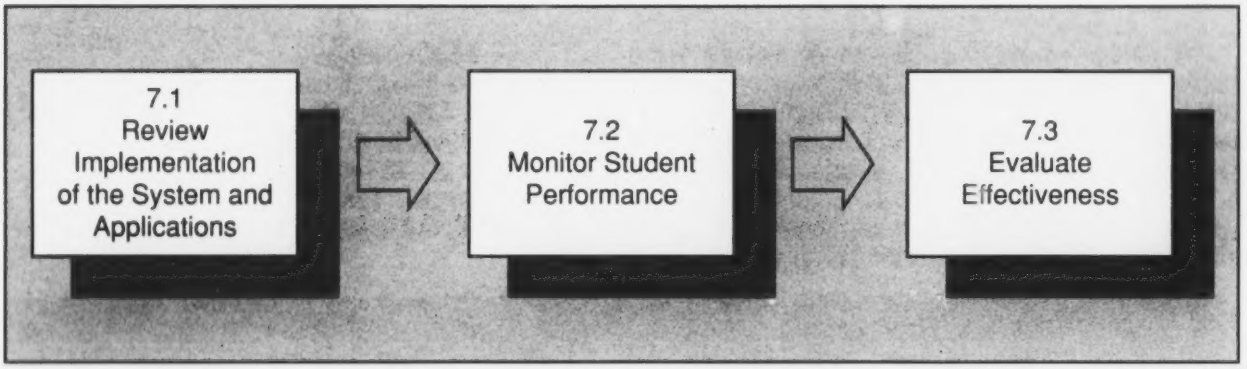
TASK 7. EVALUATE PERFORMANCE AND EFFECTIVENESS.

The rationale for a comprehensive evaluation plan is based on two requirements:

1. Accountability to the community requires timely reporting on the quality and effectiveness of technology applications.
2. Information on the effectiveness of technology for supporting the accomplishment of specific outcomes and strategies needs to be documented.

The evaluation design should:

1. Involve teachers and administrators in the development of the evaluation design.
2. Include evaluation methods and instruments in the overall program evaluation process in the district.
3. Assess students' performance on the technology competencies on an ongoing basis.
4. Conduct an overall evaluation of the effectiveness of the technology support system.



The evaluation plan should include a description of methods, instruments, procedures, time frames, and revisions based on the evaluation results. The evaluation must respond to four questions:

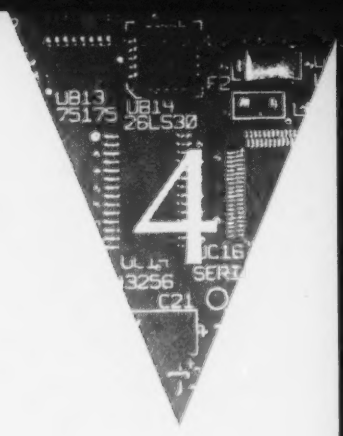
1. Is the design for the technology support system and its applications adequate?
2. Are the technology applications being implemented as planned?
3. Are students mastering the specified skills competencies?
4. Do the technology applications effectively accomplish the learning outcomes in the subject areas?

Summary.

The focus of Chapter 3 is the *Technology Planning for Improving Schools* (*TPIS*) model. The results of the spring 1991 *Survey of the Use of Technology for Instruction in Instructional Support Programs* indicate that few buildings currently have a long-range technology plan. The *TPIS* model is a guide for beginning a district or building planning process. The chapter overviews the seven major tasks required for developing a technology plan. The tasks are as follows:

1. Develop a planning structure and process.
2. Establish a direction.
3. Develop program plans.
4. Create curriculum applications.
5. Design the technology support system.
6. Prepare for implementation and change.
7. Evaluate performance and effectiveness.

The critical activities associated with each task are presented.



STAFF DEVELOPMENT

"Teachers will need continuing in-service programs as technology changes, as more effective uses of technology are developed, and as research provides a better understanding of how children learn."

- Power On! New Tools for Teaching and Learning, Congress of the United States, Office of Technology Assessment

Teachers are the critical agents of change and innovation within the teaching/learning process and school organization. High quality, comprehensive staff development programs must be provided to teachers to ensure that they are able to appropriately utilize current and emerging technologies. The national study, *Power On! New Tools for Teaching and Learning*, identifies four interrelated aspects of comprehensive technology staff development:

- training in the skills needed to use technology;
- education that provides vision and understanding of state-of-the-art developments and applications;
- support for experimentation and innovation; and,
- time for learning and practice.

Results from the spring 1991 *Survey of the Use of Computer Technology for Instruction in Instructional Support Programs* indicate that targeted technology training needs to be provided to instructional support staff. Only 36 percent of the survey respondents indicated there was a specific staff development program for the instructional use of computer technology in their buildings (refer to Chapter 2 for a review of the survey results).

The June 1991 Regents-approved *Long-Range Plan for Technology in Elementary and Secondary Education in New York State* recommends that by 1995 comprehensive staff development should be provided to all teachers. Training should focus on:

- the use of integrated software tools within the curriculum;
- the use of the statewide Technology Network Ties system for communications and resource sharing;
- the use of technology to improve decision making about educational programs for all students; and,
- the effective management of technology-enhanced teaching/learning environments.

TECHNOLOGY STAFF DEVELOPMENT CAPACITIES.

Results of the spring 1991 *Survey of the Use of Computer Technology for Instruction in Instructional Support Programs* indicate the following are major providers of technology inservice programs: school districts, Boards of Cooperative Educational Services (BOCES), Technical Assistance Centers (TACs), hardware/software vendors, and Teacher Resource and Computer Training Centers.

Teachers in North Syracuse School District's Cicero Elementary School are assessing the uses for technology at the elementary level by using a quality control grid. This log will target technology-enhanced lessons which accomplish curriculum objectives. The teachers participate in a shared-decision making committee and have demonstrated integration strategies at three statewide Model Schools/IBM workshops.

A successful first grade LOGO program was introduced to all first grade classes. The initial training in Logo took place at a BOCES via a 15 hour in-service course.

As the district's process writing program developed, and in conjunction with the introduction of LogoWriter and Bank Street Writer, teachers began to ask for word processing opportunities. Teachers received training by taking either 15 hour in-service courses offered by the district, attending day long workshops at BOCES, using free time to work with the district computer specialist, trying software while students were in the lab, or by sitting down at the computer with the class and learning with the children.

- District In-service Training Program, IBM Joint Study Site, North Syracuse School District

1. Local School District Technology In-service Programs.

Local school districts provide a wide range of in-service courses to ensure that their teachers can use and integrate technology within the classroom experience. Sixty-eight percent of the survey respondents noted that they received technology in-service from their districts.

2. BOCES Technology Staff Development Services.

New York State's Boards of Cooperative Educational Services (BOCES) provide substantial technology training services for teachers and administrators in their component school districts. Twenty-two percent of the survey respondents indicated that they received their technology in-service from BOCES. Funding for these services is provided through shared or cooperative services aid. Examples of BOCES staff development services include: Computer Services - Instructional; Computer Support - District Owned; Staff Development for Certified and Other Professional Staff; and, Computer Services - Administrative.

3. New York City Board of Education Technical Assistance Centers (TACs).

Thirty-one percent of the survey respondents indicated they received their technology in-service programs from Technical Assistance Centers (TACs). The TACs are operated by the New York City Central Board of Education's Office of Computer Resources Services. There is at least one TAC in each borough in New York City. TACs offer more than 60 microcomputer courses. College linkages, in-service training, and the Open University Program have provided teachers, administrators, aides, school secretaries, and community members with courses on such topics as authoring languages, computers for home use, the use of adaptive devices for the physically handicapped, networking computers for instructional applications, interactive database for on-line student research, the use of tool software, and basic computer awareness. The TACs offer additional courses and workshops in Satellite Centers in more than 50 schools in the New York City area.

"During the summer of 1990, Pine Bush Central School District embarked upon its IBM/SED Joint Study project. Training sessions on Teaching and Learning with Computers (TLC) were initiated in October 1990. IBM support personnel effectively instructed the staff and made them feel comfortable with both the equipment and the TLC approach. They blended different styles of presentation, which covered all the participants' concerns. Nine teachers, support staff, and BOCES support personnel spent four days becoming familiar with the use of the computer equipment, software, teaching techniques, management skills, and room design. Throughout the training, the teachers asked pertinent questions and were excited about using their new knowledge. When the training was completed, the teachers were able to use the TLC software in their classrooms."

- Larry Berger, Pine Bush Central School

4. Vendor Training.

Twenty-nine percent of the survey respondents received their technology training from hardware and software vendors. Recent industry partnerships with IBM Corporation, Apple Computer, Inc., Data General Corporation, and NYNEX have included substantial staff development programs developed cooperatively by industry, State Education Department staff, BOCES, and the Model Schools Program.

5. Teacher Resource and Computer Training Centers.

Twenty-seven percent of the survey respondents indicated that they received their technology training from New York State's Teacher Resource and Computer Training Centers. Teacher Centers are professional development centers organized and managed by and for teachers. Originally funded in 1984, the Centers dramatically expanded from 44 at that time to 111 in 1990-1991.

The provision of training on the uses of technology is one of the six statutory purposes of the Centers. Approximately 35 percent of their current activities have focused on technology.

The Centers have implemented a Teacher Center Electronic Network. Some 20,000 teachers use it to participate in computer conferencing.

The Madison-Oneida BOCES, under the direction of coordinator Francess Brewer, realized about five years ago that teachers statewide were not receiving proper computer software training or learning ways to use computers in the classroom. Through the help of State legislative funding over the past five years, BOCES has been instructing teachers in the use of computers.

Today the Model Schools Program runs in several school districts in the Central, Mohawk, Albany, Lower Hudson, Suffolk, and Nassau regions, including New York City. And it is expanding.

"Two years ago, educators from BOCES centers across the state came here for training in order to replicate the project in their regions," Brewer said. "Since then, the Model Schools Program has gone statewide."

"Across the state, there is still sporadic training of teachers, with many districts not training teachers at all to use computers," Brewer said. "And if they do teach teachers to use computers, they don't teach them how to use the computers in the classroom."

Once a district signs up to participate in the Model Schools Program, the goal is to train all the teachers through individual 15 hour courses over a two-year period. As part of their training, teachers must develop lesson plans using computers as part of classroom instruction.

"Computers are changing the way we teach," Brewer said. "The worst type of teaching technique is lecturing. Hands-on work through computers is much better where students retain the knowledge and get the skills for future employability."

- Francess Brewer, Madison Oneida Regional Information Center

MODEL SCHOOLS: A STATEWIDE COMPREHENSIVE STAFF DEVELOPMENT PROGRAM.

Model Schools is a comprehensive staff development program for training teachers how to integrate technology effectively throughout the entire K-12 curriculum. It provides a well-tested, proven model for training teachers to use technology effectively in their classrooms. Model Schools was initially developed in 1985-86 in the Central New York region to explore the use of technology in the classroom. Since then, the number of participating districts has expanded from seven Central New York State districts to more than 50 located throughout New York State. Nine BOCES or Regional Information Centers are currently offering a Model Schools service to help their districts incorporate the program.

In addition, several New York City public schools will be participating in Model Schools in cooperation with the Central Board of Education during the 1991-92 school year.

Model Schools consists of five major components:

1. *Planning.* District technology teams are taught to create a comprehensive instructional technology plan that includes developing programs from existing resources as well as planning for subsequent growth.

2. *Staff Development.* A minimum of 15 hours of training is provided to each teacher, including the production of classroom lessons which incorporate instructional applications of technology.

3. *Technology Applications.* Teachers are trained to integrate tool software packages within instruction and to produce curriculum-based lessons incorporating instructional objectives and technology applications.

4. *Telecommunications.* Teachers are trained to use Technology Network Ties' communications and resource services, including their participation in more than 40 Model Schools curriculum computer conferences.

5. *Program Evaluation and Demonstration.* Teachers are taught to develop and conduct a district technology evaluation process for establishing the effectiveness of their program for monitoring its future growth. Teacher demonstrations are shared for statewide replication.

Staff Development.

The major focus of Model Schools' staff development component is the use of technology within the entire K-12 curriculum. There are two distinct tiers in the staff development program:

Tier I. Training is offered to districts in which their teachers have acquired skills (minimum 15 hours) in such tool software applications as word processing, spreadsheet, database, graphics, and specific applications, but need integration techniques on applying these skills to all K-12 curriculum areas.

Tier II. Training is provided in specialized curriculum activities using video, animation, telecommunications, CD-ROM, hypermedia/text to teachers who have achieved a comfortable familiarity with technology in the classroom.

The Model Schools Program has promoted congruence among district core program objectives and instructional support services. The accompanying vignette on the Ilion Central School District demonstrates how a district has used this service to support teachers and students as a standard of excellence program. Planning, integration, training and telecommunications through the Model Schools Program provide ongoing support to this district.

Several training manuals, guidebooks, and compendia of lesson plans have been produced (see Figures 4.1 and 4.2 for listings of Tier I and Tier II guidebooks).

These publications represent invaluable resources which instructional support staff could use as they participate in Model Schools.

TIER I GUIDEBOOKS

- **Model Schools Coordination and Implementation Manual**
- **IBM Assistant Series Training Manual**
- **IBM Assistant Series Training Manual for Planning and Reporting**
- **IBM Tool-Based Lessons (K-12)**
- **IBM - Microsoft Works Training Manual**
- **IBM Lessons Using Microsoft Works**
- **IBM Pagemaker Training Manual**
- **Apple Desktop Publishing Lesson Plans**
- **Appleworks Learning Activities Training Manual**
- **Apple Tool-Based Lesson Plans (K-12)**
- **Macintosh Microsoft Works Training Manual**
- **Macintosh Lesson Plans in Microsoft Works**
- **Model Schools Lessons in Interactive Video**
- **Model Schools Lessons in Hypercard**

Figure 4.1 Tier I Guidebooks.

The Model Schools Program at Ilion Central Schools has offered Chapter 1 and PSEN teachers and their assistants training and guidance in using technology in reading and writing. Through the preliminary training in tool software applications, the teachers, who work with more than 400 students in K-12, have learned how to integrate computer applications into the curriculum of the school. Because core teachers and the instructional support staff are trained together and write plans together for the use of technology in the content areas together, there is a natural communication and level of congruence. For example, after the teachers have completed the awareness levels, they have moved into adapting or developing math or language arts ideas for use with computers. The Chapter I teachers have used lessons from Humanities Software and Microsoft Works (IBM) and Appleworks (Apple) to enhance the whole language approach to reading and remediation. Using charts, rhymes, rewrites of favorite poems and stories, and journal writing on the word processors, children have gained experience and insight into the composing process and critical thinking in reading.

At Ilion, one of the IBM joint study sites, the Model Schools Project has enabled the teachers - both core and instructional support staff - to rethink the classroom setup and the ways we can use technology to expand participation. At Ilion's Remington School which has a distributed network with four-five stations in each classroom, the instructional support specialists work with the children in reading. The children use the IBM TLC programs, Reading for Meaning, Information, Primary Editor Plus, and other language based programs to practice important skills. Instructional support staff have written CLOZE activities for practice at the third grade level for the Primary Editor. Children write on the computers and teachers work with them for corrections and elaborations. Some students, in addition to the time with the specialist in the classroom, are pulled out for additional work. These students can access their writing and work on the terminal in the reading room and the teacher and student can work closely together on these materials. At Ilion's Barringer Road School, which uses Apple computers, the work with the Model Schools Program is slightly different and students use their classroom computers and reading/math room terminals for similar types of instruction. In math, at the Remington site, there has been frequent use of the IBM Money, Time and Measurement (MTM) program for graphing and analyzing data. The instructional support teacher takes data the students have done in science and social studies (i.e., weather data, information on food groups eaten each day, results of a survey of favorite things), and has the students create and interpret the charts and spreadsheets that can be done with MTM. Again these skills are going beyond the basics usually stressed with at-risk students and are challenging them to think it through to create information, rather than simply practice computational skills.

Model Schools has been an important teacher training program at Ilion: it has enabled teachers - core and instructional support staff - to speak the same language in terms of technology - and to focus on the same higher order instructional goals for students. It has built congruence to a meaningful collaboration that occurs daily and in which the student sees the relationship between the extra assistance he/she receives within the regular program. Model Schools reinforces the need to see technology in use in the disciplines; the integration of the content areas; and the support and sharing of ideas by teachers through TNT.

- *Grace Osborne, Director of Curriculum and Model Schools Site Administrator for the Ilion Central School District*

TIER II GUIDEBOOKS

- **Reading and Writing Curriculum Development**
- **Whole Language Manual of Lesson Plans**
- **Technology Education Curriculum**
- **Fischertecknik Computer-Controlled Machines**
- **Earth Science Acuweather Lesson Plans (IBM)**
- **USA Today Lesson Plans (Macintosh)**
- **Special Education Remote Project Procedural Guide**
- **Special Education Lesson Plan Manual**
- **Social Studies**
- **Model Schools "T.A.L.K." for TNT Classrooms Telecommunications**
- **TNT/CoSy Training Simulation on Conferencing for Curriculum Development and Instruction**

Figure 4.2. Tier I Guidebooks.

Technology Applications.

Teachers participating in Model Schools are trained to integrate tool software packages within instruction and to produce curriculum-based lessons incorporating instructional objectives and technology applications. The expertise acquired in producing these lessons would be invaluable in helping instructional support staff integrate technology applications within their teaching strategies. Several thousand lesson plans have been produced by participating classroom teachers and they have been distributed to the participating Model School districts. Lessons have been developed for all computer environments using such integrated software packages as *Microsoft Works*. The lessons address all curriculum areas and grade levels. Figure 4.3 is an example of a teacher developed lesson plan.

Telecommunications.

Teachers are trained to use Technology Network Ties' communications and resource services, particularly computer conferencing. Teachers also participate in several Model Schools curriculum computer conferences. There are over 40 computer conferences that instructional support staff may join as a result of Model Schools training (see Figure 4.4 for a list of current computer conferences).

One example of a telecommunications network for curriculum teachers that uses both computer conferencing and other electronic communications is BUSNET. BUSNET is an interactive computer-based communications network through which the business/marketing education community throughout New York State can exchange information and share materials. BUSNET includes both computer conferencing and electronic mail capabilities. Business teachers use electronic mail to correspond instantly with any other teacher in New York State who is a member of the network. The computer conferencing capability provides a bulletin board/general forum type of conference that allows business teachers to post questions, receive information, and respond to messages on a variety of topics ranging from curriculum resources and strategies to upcoming conferences, workshops, and other events.

MSP LESSON PLAN

COUNTRY DATA

Hardware Needed: Macintosh Plus (or better)
Software Needed: Microsoft Works

Objective(s)/Purpose(s):

1. Students enter information into a database using Microsoft Works.
2. Students show that they can retrieve information from the database to compare it with the databases developed by other students on their respective "countries of concentration."
3. Students use the information in the database to compose a "country report."

Description/Plan:

1. Students are assigned a nation within a geographical area of study (e.g., the Middle East, West Africa, Eastern Europe). They research this nation, taking notes on any information related to the database files specified in the sample informational chart.
2. Students load the database form, insert essential information gained from their research for each file, and print out the resulting database. Printouts are later compared in class, and each student writes a "country report," using the "framed paragraph" technique in I.L.A.

Database Fields:

Country Name
Northern Boundary
Southern Boundary
Eastern Boundary
Western Boundary
Area
Geographic Features
Natural Resources
Climate
Capital
Other Cities
Population
Common Jobs
Products
Government Type
Things to See
Other

Subject: Social Studies **Grade Level: 6**

Figure 4.3. Model Schools Lesson Plan.

"The Model Schools Program has also been assisting art teachers by providing them the opportunity to communicate and exchange classroom ideas over CoSy, a conferencing system available over New York State's Technology Network Ties (TNT). Using the conference called MSPART, the teachers are investigating various software programs recommended by their colleagues. While the Model Schools Program supports teacher education at the district level, many art software courses are not offered because of an insufficient number attending such a specific topic. Conferencing fills this very important need."

- Larraine McNulty, Mount Markham Central School, West Winfield, New York

STUDENT TALK is a recently implemented student-centered component of BUSNET. Business/marketing students use it to communicate electronically with each other and work on cooperative projects.

Instructional support staff could create their own conferences or join existing conferences like BUSNET and others listed in Figure 4.4.

MODEL SCHOOLS COMPUTER CONFERENCES

- **Model School Program Site Administrators**
- **Discussion Forum for Science Teachers**
- **Model School Program Special Education Committee Members**
- **Statewide Model Schools Program Coordinators**
- **Student Telecommunications Activities**
- **Model Schools Program Technology Committee Business**
- **Model Schools Telecommunications Training**
- **Forum for Foreign Language Teachers**
- **Technology Planning for Improving Schools**
- **Art Education in New York State**
- **Business Education Student Conference Planning Area**
- **BOCES Computer Coordinators Discussion**
- **Forum for Business Education Teachers**
- **Questions and Answers - CoSy Use**
- **Directors' Committee on Instruction**
- **Discussion of the Math Curriculum**
- **Information and Activities of Model Schools Program**
- **Model Schools Program Art Committee Members**
- **Planning Area for Model Schools Program TALK Activities**
- **Model Schools Program Reading and Writing Business**

Figure 4.4. Model Schools Computer Conferences.

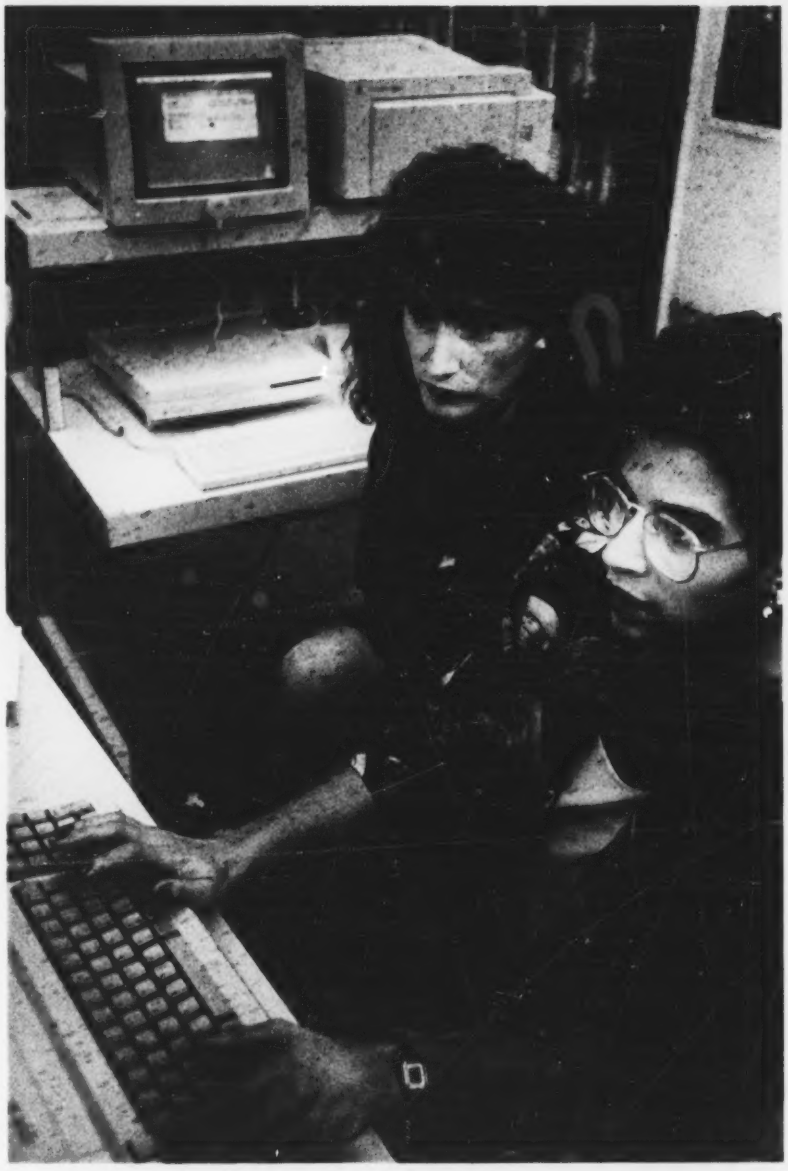
Summary.

The respondents to the spring 1991 *Survey of the Use of Technology for Instruction in Instructional Support Programs* indicated that quality staff development is essential to enable teachers to effectively use technology within their programs. Chapter 4 briefly describes the major local, regional, and statewide providers of technology training, including:

- District in-service programs
- BOCES technology training services
- New York City Technical Assistance Centers
- Vendor training programs
- Teacher Resource and Computer Training Centers.

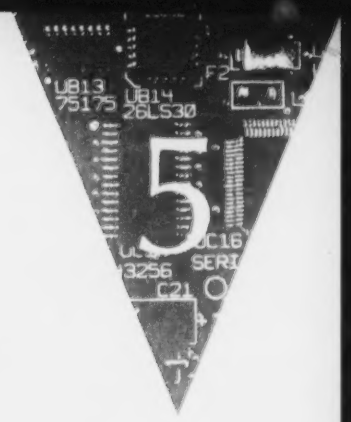
The primary focus of the chapter is a description of the Model Schools Program, which is a well-tested, proven model that may be used for training instructional support staff to use technology in their programs. This chapter summarizes the following Model Schools activities:

- Planning.
- Staff development
- Technology applications
- Telecommunications.



A brief review of Model Schools guidebooks, technology-based lessons, and computer conferences is presented.

Read
Write
& Publish



SOFTWARE EVALUATION AND SELECTION

Teachers need to select computer software programs that are appropriate for use in the classroom. The evaluation of computer software is a critical process in the development of an effective approach for integrating technology within the teaching/learning environment of the school.

The results of the spring 1991 *Survey of the Use of Technology for Instruction in Instructional Support Programs* provide a profile of the current use of computer programs in the classroom (refer to Chapter 2 for a review of the survey results). For example, 65 percent of the respondents are using subject specific software programs in their instructional support programs. Seventy-eight percent of the respondents indicated that they are using computer assisted instruction (CAI) software. Finally, the most frequently used integrated learning systems are IBM Corporation's Writing to Read program and the Instructional System Incorporated/Computer Curriculum Corporation (ISI/CCC) system. Subject specific software, computer assisted instruction, and such programs as Writing to Read and ISI/CCC have been used for the teaching of basic reasoning and content skills. Today it is vital for regular classroom teachers and instructional support staff to cooperatively review, evaluate, and select a wide range of computer software programs and systems that emphasize problem solving and critical thinking as well as more basic skills. Chapter 5, "Software Evaluation and Selection," includes six suggested preliminary steps for selecting computer software and an example of a computer software evaluation form.

PRELIMINARY STEPS FOR SELECTING AND USING COMPUTER SOFTWARE.*

The following steps are a guide for selecting and using computer software in the classroom:

Step 1: Review Curriculum and Syllabi for Intended Learning Outcomes.

Review curriculum syllabi or guidelines. If these documents include specified learning outcomes, check these outcomes to see if they include objectives for reasoning and thinking skills.

* The steps for selecting computer software are derived from "A Procedural Model for Selecting Computer Software for Classroom Use", Bureau of Technology Applications, 1991.

Step 2: Review Test Content for Consistency with Learning Outcomes.

Review test content and practice for consistency with intended learning outcomes and instructional use within classroom practices. Determine if specific testing objectives in your school can be addressed through computer-based testing.

Step 3: Discuss Approaches to Student Learning with Colleagues.

Discuss your understanding of how students learn best in your school with other teachers. This may influence the software you select because certain programs may not motivate your students or may be incongruous with their approach to learning.

Step 4: Select Instructional Strategies which are Consistent with Learning Outcomes.

Select instructional strategies which are consistent with the learning outcomes that you have developed for the curriculum. For example, if the emphasis in the curriculum is on the development of higher-level thinking skills, then appropriate and proven techniques should be used to accomplish these outcomes.

Step 5: Conduct an Initial Review of Computer Software for Appropriateness.

Conduct an initial review of computer software to determine its appropriateness for addressing the learning outcomes and instructional strategies that have been selected. The review should include reading the producer's description of the software program and evaluating the program for appropriate use in the classroom.

Step 6: Selection of Specific Software Programs.

Based upon the results of step 5, select the software program that is appropriate for use in the classroom.

SOFTWARE SELECTION AND EVALUATION CRITERIA.**

The following is a sample evaluation form that may be used for selecting and evaluating software programs for appropriate use in the classroom.

** This form is derived from the Ad Hoc Committee on Computer Courseware Evaluation Guidelines for the National Council for the Social Studies.

SOFTWARE EVALUATION FORM

Reviewer's Name: _____ Date of Review: _____

Program Title: _____

Producer: _____

Required Hardware: _____ Required Software: _____

Software Protected: ___ yes ___ no Back Up Policy: _____

Medium: ___ 5" flexible disc ___ 8" flexible disc ___ hard disc

___ CD-ROM ___ laser disc _____ other (specify)

PART 1

PROGRAM OVERVIEW AND DESCRIPTION

1. Subject area _____

2. Grade level (circle) 1 2 3 4 5 6 7 8 9 10 11 12

3. Instructional technique (check all applicable)

___ Remediation ___ Standard Instruction ___ Enrichment
___ Assessment ___ Instructional Management ___ Tutorial
___ Tool Application ___ Authoring System ___ Simulation
___ Problem Solving ___ Education Game ___ Other

_____

4. Group instructional size (check all applicable)

___ Individual ___ Small Group ___ Class

5. Briefly list the program's instructional objectives.

_____

_____

_____

6. Briefly describe the program.

_____

_____

_____

PART 2

CONTENT EVALUATION

The following evaluation criteria are organized around three areas: knowledge, skills, and values. A checklist is provided to determine the emphasis a computer software program places upon each area. Please check the appropriate heading for each of the following questions.

Knowledge

Strong Emphasis	Moderate Emphasis	Inadequate Emphasis	Not Applicable	
____	____	____	____	Does the program emphasize currently valid knowledge from one or more disciplines?
____	____	____	____	Does the program present a true and comprehensive body of content, free of distortion by omission?
____	____	____	____	Does the program deal with important concepts, principles, and theories?
____	____	____	____	Does the program avoid bias and/or stereotyping with regard to gender, ethnicity, racial background, religious application, or cultural group?

Skills

Strong Emphasis	Moderate Emphasis	Inadequate Emphasis	Not Applicable	
____	____	____	____	Does the program pose problems which require students to use the methods of inquiry?
____	____	____	____	Does the program foster the development of critical thinking skills?
____	____	____	____	Does the program develop decision making skills of identifying alternatives, establishing criteria to evaluate alternatives, evaluating alternatives in light of criteria and making decisions?

Values

____	____	____	____	Does the program help students develop an appreciation of beliefs and values on human behavior patterns?

PART 3

PRESENTATION

Yes	No	Not Applicable	
____	____	____	Is the program free of technical problems?
____	____	____	Are the instructions clear?
____	____	____	Is the curriculum material logically presented and well-organized?
____	____	____	Are graphics, sound and color used to enhance the presentation?

INTERACTION

Yes	No	Not Applicable	
____	____	____	Is effective and appropriate feedback provided?
____	____	____	Are cues and prompts included to help students answer questions?
____	____	____	Can students access the program menu for help or new activities?
____	____	____	Can a student move quickly into different parts of the program?

TEACHER USE

Yes	No	Not Applicable	
____	____	____	Does the program include student record keeping?
____	____	____	Can the teacher modify the program?
____	____	____	Is the documentation clear?

COMMENTS

Summary.

The selection of appropriate computer software is vital to ensure that technology is effectively integrated within the curriculum. Chapter 5 identifies five preliminary steps for selecting computer software, which include:

- Review curriculum and syllabi for intended learning outcomes.
- Review test content for consistency with learning outcomes.
- Discuss approaches to student learning with colleagues.
- Select instructional strategies consistent with learning outcomes.
- Conduct an initial review of computer software for appropriateness.
- Select specific software programs.

Chapter 5 also includes a sample Software Evaluation Form. Instructional support staff can follow the procedures and use the form to ensure that software is selected which complements specified learning outcomes and classroom strategies for teaching these outcomes.

BEST COPY AVAILABLE

APPLICATIONS AND PROGRAMS

The Technology Network Ties (TNT) network was developed by building upon the consolidated and upgraded computer resources of New York State's Boards of Cooperative Educational Services (BOCES) Regional Information Centers. Nine BOCES Regional Information Centers, the New York City Central Board of Education, the City School Districts of Buffalo, Rochester, Syracuse, and Yonkers, and the State Education Department are connected to form the backbone of the TNT network. A New York City-wide telecommunications network, called NYCENET, links New York City's school districts to the Central Board of Education's Division of Computer Information Services mainframe computer. This computer is connected to the statewide TNT network.

Over 50 percent of New York State's school districts, and all 41 BOCES have access to the network because of their existing computer connections to the Regional Information Centers and to the New York City Central Board of Education Division of Computer Information Services.

The statewide backbone of the TNT network is illustrated in Figure 6.1. Figures 6.1a and 6.1b illustrate a regional network of BOCES connected to TNT through a Regional Information Center and a network of school districts linked to TNT through their BOCES. Figure 6.1c illustrates a network of New York City community school districts connected to TNT through the Division of Computer Information Services.

1. TNT: PLATFORM FOR IMPLEMENTING TECHNOLOGY IN THE CLASSROOM.

TNT is the technological platform for implementing the State's *Long-Range Plan for Technology in Elementary and Secondary Education*. The *Long-Range Plan* recommends the connection of each school building in the State to TNT by 1995. Within each district, school buildings will be interconnected for district-wide communications and information sharing. Regional, State, national, and international communications and information will be accessible to all school buildings through their links to the TNT network.

The *Long-Range Plan* also suggests that computer workstations in each classroom within a school building be linked into a classroom/building network. This will include

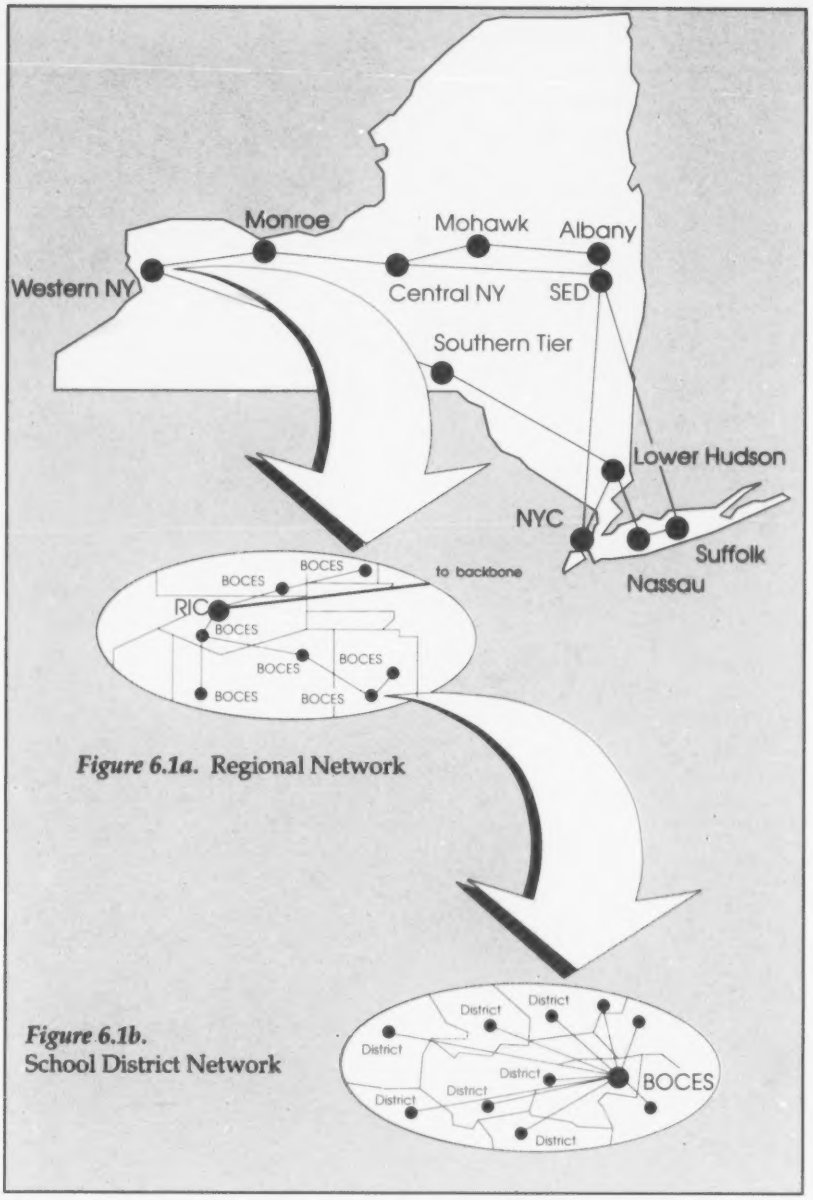


Figure 6.1a. **Regional Network**

Figure 6.1b.
School District Network

Figure 6.1. Statewide TNT Backbone.

student and teacher workstations connected to a computer server. A teacher presentation system, incorporating a computer, CD-ROM, laser disc, and a large screen monitor, is included in the classroom network. The *Long-Range Plan* recommends that each networked classroom in a building be interconnected to enable teachers, students, and administrators to exchange messages, share resources, and engage in cooperative planning, teaching, and learning. Figure 6.2 depicts a classroom network and Figure 6.2a illustrates the hardware components of the teacher presentation system.

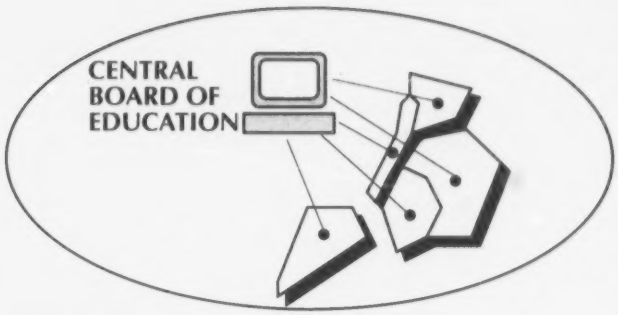


Figure 6.1c. New York City Network

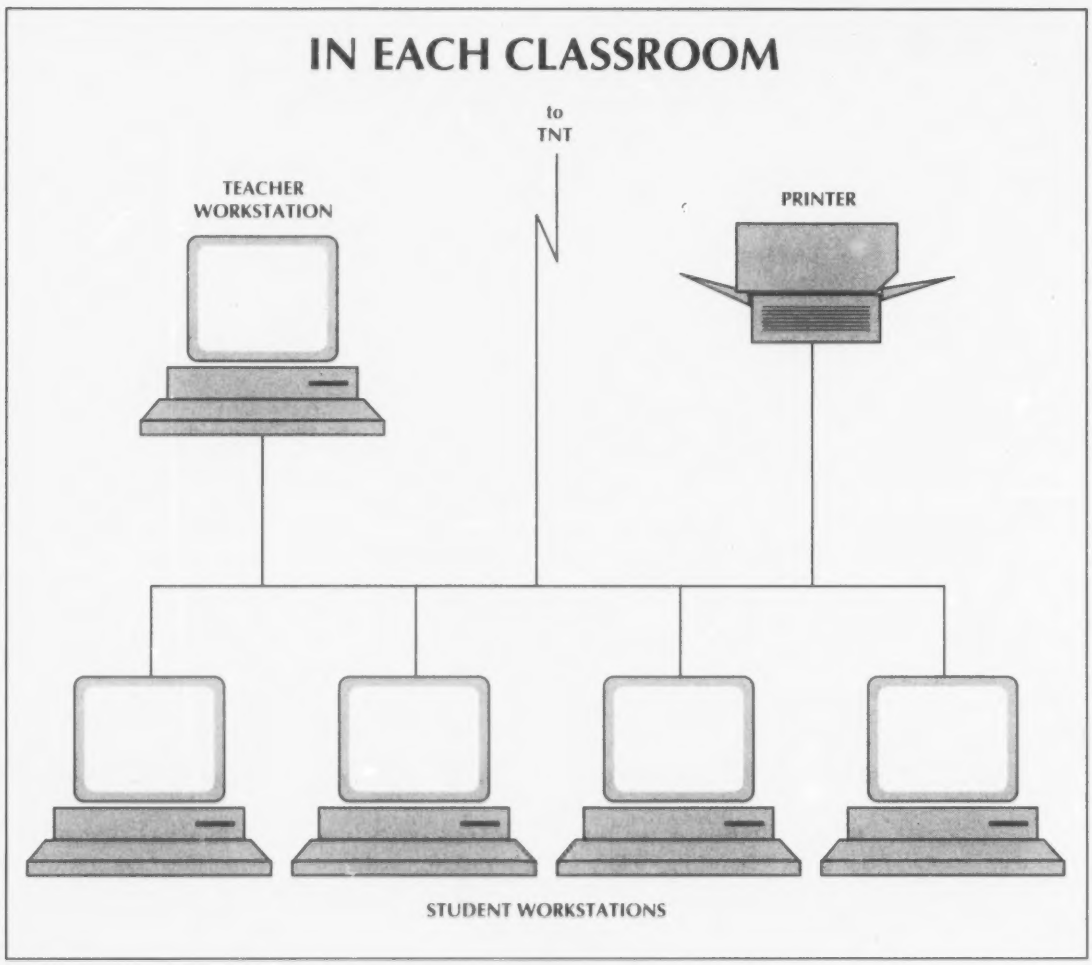


Figure 6.2. Classroom Network.

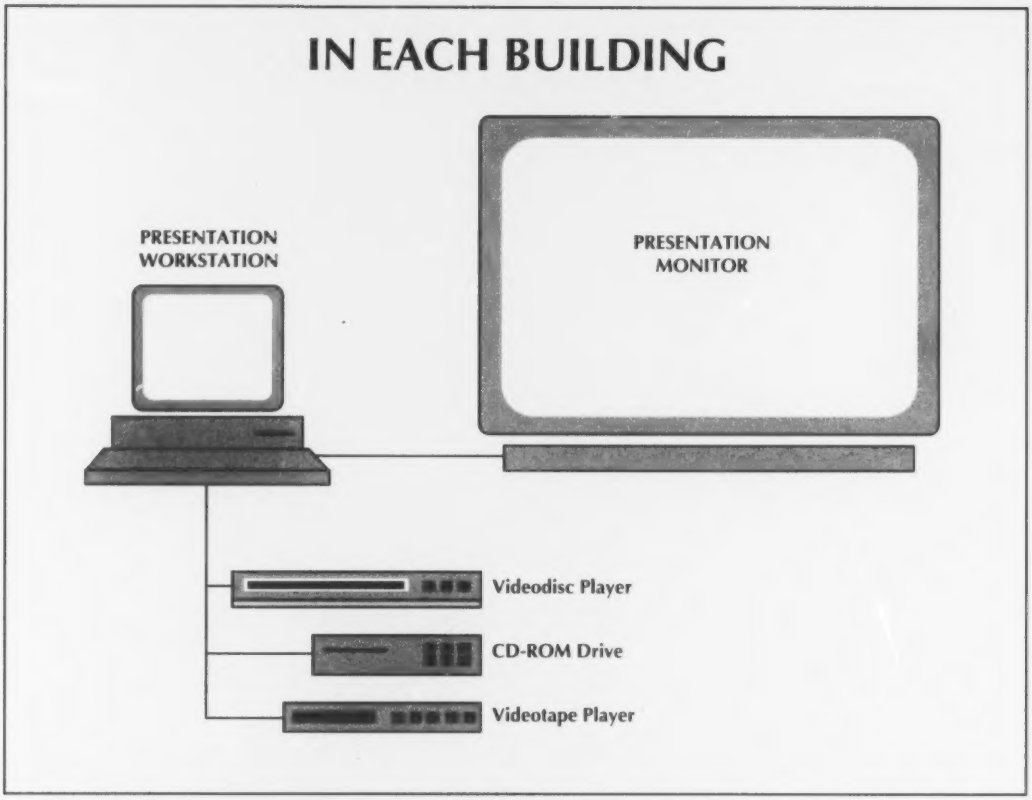


Figure 6.2a. Teacher Presentation System.

2. COMMUNICATIONS TECHNOLOGIES FOR SHARING INFORMATION AND RESOURCES.

Teachers can use communications technologies to exchange messages, share resources, and participate in ongoing conferences on educational topics. A wide range of these technologies is used today, including computer based message systems, facsimile (fax), computer conferencing, and voice mail. Electronic mail and computer conferencing are two communications services available over the TNT network.

The results of the spring 1991 *Survey of the Use of Technology for Instruction in Instructional Support Programs* indicate that the use of electronic mail is beginning to emerge in instructional support programs. Twenty-nine percent of the respondents indicated electronic mail was used in their buildings.

The educational benefits of using electronic mail and computer conferencing are:

- Electronic messages can be sent instantaneously to other teachers and students in the school building, district, region, state, nation, or international community. Electronic communications help to eliminate telephone tag.

- A student can use electronic mail to ask a teacher to clarify an assignment or educational issue at night or over the weekend when school is not in session and teachers are not available for student meetings.

"Whitney Point High School students in a computer applications class have been participating in an exciting communications process. As part of their telecommunications unit, these high school students are using computers to compose, check spelling, and transmit messages to people in other parts of the world.

Students in this class select countries, receive names of pen pals, and then send their messages. Citizens from other countries retrieve their messages, usually responding within a day or two.

Students have sent and received messages from Torpshammer, Northern Sweden; Per-Jussy, Eastern France; Elsternwick, a suburb of Melbourne, Australia; and other communities around the globe. Electronic messaging has given Whitney Point students the opportunity to interact with people who experience different traditions and speak different languages."

- Norman Kresge, Whitney Point School District

- A teacher can send an electronic message to an absentee student regarding homework assignments or preparations for an educational activity that will be presented in the class when the student returns to school.

- Teachers can participate in specific curriculum computer conferences for sharing teaching strategies, lesson plans, and educational research.

- Students can participate in international computer conferences relating to their respective cultures, educational systems, and communities, thus fostering multicultural understanding and increasing students' appreciation of diversity.

TNT Electronic Mail.

Electronic mail is a general name for noninteractive communications of text, data, image or voice messages between a sender and a designated recipient by systems utilizing telecommunications links. IBM's Professional Office System (PROFS) currently provides electronic mail and document distribution to all persons connected to TNT. PROFS is currently available to all BOCES, 425 school districts, and State Education Department offices. There are over 8,500 PROFS accounts throughout the State.

PROFS messages are exchanged daily between persons for increasing communications and efficiency. Communications via PROFS on the TNT network provides teachers, students, administrators, other district staff, BOCES, and City School District Central Boards of Education with a reliable, efficient, and inexpensive means of communication not dependent on time or personal availability. TNT/PROFS mail also is linked through TNT gateways to a number of national and international networks such as the National Science Foundation Internet. Through gateways PROFS mail can be sent to thousands of users around the nation and the world.

TNT's PROFS system also provides the capability to create distribution lists, develop calendars, and search the directory of TNT users. A user can create a list of persons to whom one routinely sends information. PROFS calendar function enables a user to track activities with daily and monthly schedules. A person can add and change appointments, add on-line notes to the appointment as a reference, add a regular, recurring appointment, reschedule appointments, and add confidential appointments. PROFS also allows a user to search the TNT directory to find a particular person.

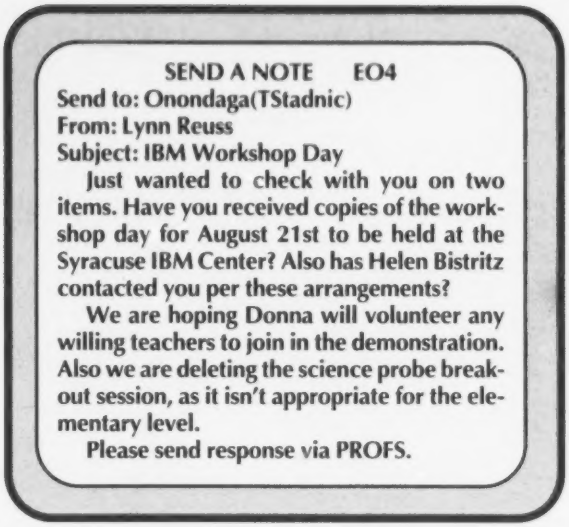

SEND A NOTE EO4
Send to: Onondaga(TStadnic)
From: Lynn Reuss
Subject: IBM Workshop Day
Just wanted to check with you on two items. Have you received copies of the workshop day for August 21st to be held at the Syracuse IBM Center? Also has Helen Bistritz contacted you per these arrangements?
We are hoping Donna will volunteer any willing teachers to join in the demonstration. Also we are deleting the science probe breakout session, as it isn't appropriate for the elementary level.
Please send response via PROFS.

Figure 6.3. PROFS Message.

The following illustrate current uses of TNT's electronic mail system in specific educational programs:

1. Model Schools teachers and coordinators use electronic mail for discussing program issues. Figure 6.3 is a TNT PROFS message sent from the State Education Department's coordinator to all regional coordinators informing them of their involvement in an upcoming staff development workshop. The capability to communicate instantaneously with nine regional coordinators reduces travel.

2. Electronic mail is used in the Youth-At-Risk Electronic Clearinghouse for clarifying issues about program coordination and for scheduling meetings.

3. School districts participating in recent industry partnerships use PROFS for communicating with industry representatives on implementation and technical issues.

"Through telecommunications, students at Dolgeville Central School are able to `talk' with famous people from the past, present, or future.

Bill Naple, a special education instructor plays the role of the 'on-line' personality. Students log onto the Fido Bulletin Board and type questions to be answered by Mr. Naple. Through responses to those questions, the students gain knowledge about the individual and a better understanding of the related time era.

The use of the telecommunications contact person concept is also used to motivate students in other classrooms. Mrs. Bonnie Kirchofer is helping students do library research about the 'On-Line Personality.'

Students have been taught to use three portable computers for telecommunicating. The students take the computers home from school and can access the Fido Bulletin Board in the evening or during weekends from their homes."

- William Naple, Dolgeville Central Schools

TNT Electronic Conferencing.

A computer conferencing system is a "person to group" means of communication. It can be seen as something that is halfway between a face-to-face meeting and a very rapidly published newsletter. It can be used by hundreds of people at different geographical locations and offers a way to share ideas and information that is time and location independent.

Participants in a computer conference can sign onto TNT, access the computer conferencing system, and read all the contents of the conferences of which they are members. They can send their responses directly to all other members of the conference.

The educational benefits of computer conferencing are:

- Scheduling for conferencing participation is not required; participation is time and location independent.
- A person can participate in numerous ongoing conferences, using much less time than would be required for face-to-face meetings.
- All messages on a particular topic are organized *around that topic.*
- Computer conferencing can be used to organize issues and test solutions prior to face-to-face meetings.

The simplest type of conferencing system is the electronic bulletin board of information which can be accessed by all participants. In more sophisticated conferencing systems, the software may simulate a conference consisting of main themes and breakout sessions or forums occurring simultaneously. Continuous dialogue on a topic or issue is made possible through computer conferencing.

There are several computer conferences on the TNT network. These include:

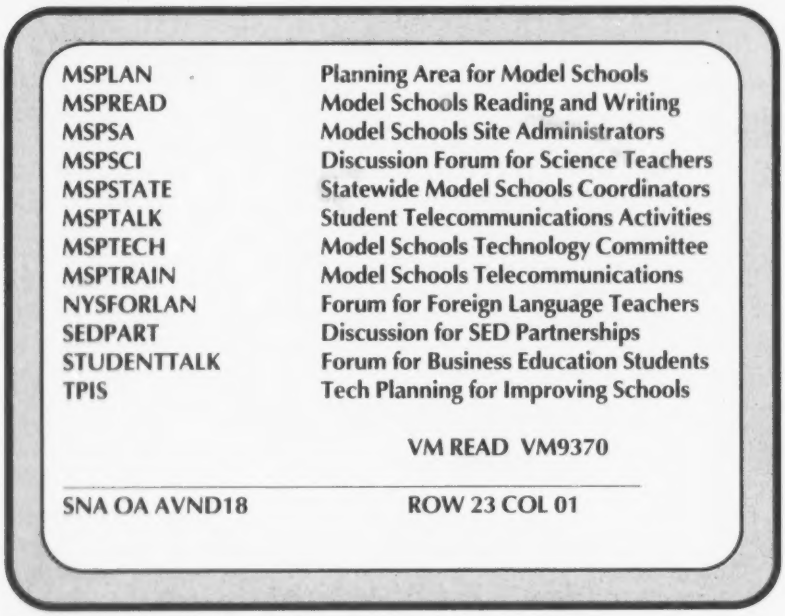

MSPLAN Planning Area for Model Schools
MSPREAD Model Schools Reading and Writing
MSPSA Model Schools Site Administrators
MSPSCI Discussion Forum for Science Teachers
MSPSTATE Statewide Model Schools Coordinators
MSPTALK Student Telecommunications Activities
MSPTECH Model Schools Technology Committee
MSPTRAIN Model Schools Telecommunications
NYSFORLAN Forum for Foreign Language Teachers
SEDPART Discussion for SED Partnerships
STUDENTTALK Forum for Business Education Students
TPIS Tech Planning for Improving Schools
VM READ VM9370
SNA OA AVND18 ROW 23 COL 01

Figure 6.4. Model Schools Computer Conferences Menu

1. Model Schools Curriculum Computer Conferences. Over 2,500 students, teachers, and program coordinators participate in one or more Model Schools computer conferences organized around curriculum areas. Currently, 30 computer conferences support 40 different forums or topical conferences. Figure 6.4 is a menu of some of the conferences available to a TNT user.

Figure 6.5 includes messages exchanged over a two-day period by four educators located in different regions of the state around a particular topic.

2. *Youth-At-Risk Computer Conference.* A computer conference has been developed for the Youth-At Risk Electronic Clearinghouse. The conference includes three major topics:

- Sharing. Information is disseminated on topics such as notable upcoming conferences on youth-at-risk, youth-at-risk publications, and concerns from grant coordinators.
- Funding. A forum has been established for local, State, and national funding alerts.
- Manage. The Division of Student Development and Family Support Services and Youth-At-Risk field coordinators use this forum to discuss such topics such as meeting schedules, completing project forms, and impending site visits.

SEDPART/IBM #6, from PATKINS on 4 Jun 1991 at 14:25:14
There is/are comment(s) on this message

Title: Writing to Read
Is anyone using Writing to Read in the classroom?
VM READ VM9370

SEDPART/IBM #8, from BENGELL on 4 Jun 1991 at 20:33:53
This is a comment to message 6

We at Remington would also be interested in Writing to Read.
What are the reactions of people using it?
VM READ VM9370

SEDPART/IBM #9, from FBREWER on 5 Jun 1991 at 09:14:25
This is a comment to message 6

Both the Wettel and Ilion IBM Sites are using Writing to Read.
Wettel is networking Writing to Read for next year. Both sites
have seen Writing to Read and are interested in using it.
VM READ VM9370

SEDPART/IBM #10, from TDETJEN on 6 Jun 1991 at 11:38:47
This is a comment to message 9

We have just received a demo version of Writing to Read on
CD-ROM from IBM and will be looking at it. The best people
to review it are the language arts teachers.
VM READ VM9370

Figure 6.5. Example of a Computer Conference Forum.

3. *BUSNET.* BUSNET is a telecommunications network used by business/marketing education for sharing information and materials. Two conferences have been installed as features of BUSNET:

- A bulletin board/general forum type of conference for posting questions, receiving information, and answering questions on curriculum resources, future workshops, and other activities.

- STUDENT TALK permits students to communicate electronically with each other and work on cooperative projects. Over 600 business/marketing education students use BUSNET.

4. *Technology Planning for Improving Schools.* A conference has been established for BOCES representatives, school district staff, and State Education Department staff who participated in regional Technology Planning for Improving Schools workshops. Discussion topics focus on developing comprehensive district-level instructional technology plans.

5. *Technology Industry Partnership Conference.* A conference has been set up for school district staff, industry representatives, BOCES representatives, and State Education Department staff participating in the industry partnerships with IBM Corporation, Apple Computer, Inc., and Data General Corporation. Five forums, each on a different partnership, have been started.

Other Conferencing Networks.

1. *TechNet: Telecommunications for Technology Educators.* TechNet is an interactive computer-based network through which technology educators can share learning activity ideas, test questions, and exchange ideas on curriculum materials. Students in Technology Education classes can communicate with other students across New York State through TechNet.

2. *New York State Teacher Center Telecommunications Project.* New York State Teacher Resource and Computer Training Centers have access to a computer network that provides teachers with electronic communications. State Education Department staff can disseminate information efficiently and quickly to Teacher Centers using the network. Three examples of the 60 conferences available are:

- TRC-Centers - Provides general information on Teacher Centers.
- TRC-Nat - Discusses needs assessment on technology for the regional networks.
- TRC-Resources - Acts as a clearinghouse for Teacher Centers.

3. MANAGEMENT AND INSTRUCTIONAL SUPPORT APPLICATIONS AND SERVICES.

Several database management applications are accessible over the TNT network for gathering and reporting a variety of student, building, district, and program information. These systems are designed to support teachers and administrators in making decisions about instructional programs and student services. The Student Information System (SIS), the New York State Student Achievement Tracker (TRACKER) system, and

the Local Education Agency Programs (LEAP) Evaluation and Reporting System provide instructional support staff with required student data, evaluation data for Chapter 1 Program Improvement reports, and data required for the annual review of effectiveness. In addition, such services as Job Link, the Financial and Administrative Management for Education, or FAME, System, and access to other information databases are useful resources for enhancing instructional support programs.

Student Information System.

In 1987, the New York State Legislature allocated funding for the development and implementation of a comprehensive, computer-based student information system. The student information system includes student biographical information, attendance, academic progress, course/scheduling, program participation, instructional management, and health/medical. The system allows authorized teachers and principals to quickly identify and analyze such things as academic and attendance trends.

Through the involvement of the State Education Department, the development of the Student Information System in the Big Five Cities has been coordinated with all of the Regional Information Centers in order to develop a consistent statewide system under the Technology Network Ties program.

Throughout the summer and fall of 1989, the State Education Department conducted a review of existing and projected student information reporting requirements, including those related to instructional support services. These requirements were incorporated within the development of SIS to ensure that the system was sufficiently comprehensive for addressing the student information needs of school districts and the State Education Department. For example, the design of the SIS system allows a school district to do the following:

- Register a student.
- Enroll a student in a program of study.
- Collect a wide variety of demographic data about students, parents, and associated adults.
- Maintain daily attendance of students.
- Record the student's grades and generate reports.
- Help place children with handicapping conditions in appropriate programs.
- Provide required State data on students.

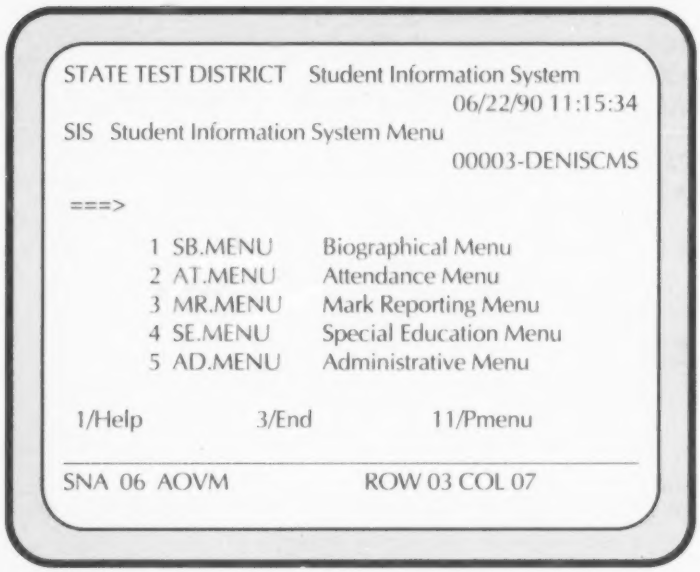


Figure 6.6. Student Information System Main Menu.

The first design of the Student Information System was reviewed in the field in Spring of 1990. It included five major components: biographical; attendance; mark reporting; special education; and attendance.

Figure 6.6 is the main menu for the SIS system.

The SIS system was initially field tested in October of 1990. Regional Information Centers and the districts they serve can access the SIS pilot system via the TNT network. Some of the following functions will soon be provided to school districts as part of enhancements to SIS:

- Maintaining historical information to generate transcripts;
- Tracking students who have attendance and discipline problems;
- Recording and maintaining standardized tests scores;
- Generating System to Track and Account for Children (STAC) reports; and
- Recording and maintaining information about student lockers and student transportation.

New York City Central Board of Education Automate the Schools (ATS) Project.

In New York City, the Automate the Schools (ATS) Project parallels the services offered through the Student Information System (SIS). ATS was designed to provide a Central Board of Education computer system for serving the schools, administrators, and policymakers of the New York City public school system. The goals of ATS are to:

- reduce paper work;
- speed data access;
- increase the accuracy of the data collected; and,
- transmit the data throughout the Central Board.

The first ATS project has been the implementation of a computer student system automating all daily student accounting routines including:

- student biographical information
- attendance records
- standardized test scores
- student scheduling
- subject class attendance
- immunization
- grade reporting.

Student applications slated for development in the near future include:

- reduced cost or free meal eligibility special programs
- high school and junior high school transcripts
- reduced fare eligibility
- immunization
- transportation.

In addition to automating student records, the second major thrust of ATS is to provide the means of implementing boardwide administrative systems at the school level. Administrative functions currently being addressed by ATS or planned for implementation include:

- a statewide PROFS electronic mail system
- the Substitute Teacher Registry System (STRM)
- the on-line E-Bank payroll
- the Board's Employee Information System
- the integrated Purchasing and Inventory Control System (IPIS)
- various other administrative functions.

ATS is working with managers of these systems to permit enhanced access to schools and improve service delivery through the use of the network's five borough, 32 district boardwide system.

New York Student Achievement Tracker (TRACKER).

The New York Student Achievement Tracker (TRACKER) was designed and constructed specifically to help school district staff manage student data in a more efficient and purposeful way. It assists educators, including instructional support staff, in responding to many of the various Federal and New York State compensatory program evaluation and reporting requirements.

TRACKER represents an important direction for the future of local level data processing. TRACKER was developed by the State Education Department in collaboration with regional Boards of Cooperative Educational Services (BOCES) and with representatives of local school districts to address specific needs of the state's existing data processing and reporting systems. TRACKER provides instructional and administrative staff at the local level increased access to a variety of pupil and program level data.

TRACKER provides facilities for tracking student demographic data, historical student and program level test score information, and historical compensatory instructional services data. Tracker provides options for tracking individual schools, grades served, staff, yearly services, and the district's tests and subtests.

TRACKER can be used to generate administration and evaluation reports of interest to building and district staff. Reports include participation counts, summaries of students served by grade, evaluation reports, sustained effects reports, and reports that address such evaluation concerns as Chapter 1 program improvement reports, LEAP data summaries, and rank ordered scores. Figure 6.7 is an example of a TRACKER evaluation report.

Achievement Report for Students Funded by: ECIA Chapter 1

School Year: 1989 - 1990
Subject: Reading
Concentration Area: Reading Comprehension
Minimum Service Hours: 0

Mean			No. of Students	Pretest	Postiest	NCE Gains
School: Rowe's School (0004)						
Grade	Test					
2	85-86 CAT		16	49.3	50.1	0.8
3	85-86 CAT		17	49.0	51.1	2.1
6	85-86 CAT		11	42.5	45.2	2.7
		School Totals	44	48.7	50.3	1.6
		Grand Totals	44	48.7	50.3	1.6

Figure 6.7. TRACKER Report.

Local Education Agency Programs (LEAP) Evaluation and Reporting System.

The Local Education Agency Programs (LEAP) Evaluation and Reporting System is the mechanism which New York State uses to collect and analyze evaluation data for categorically aided programs. The individual pupil data reported can be used to improve instructional management decisions at the local, State, and Federal levels.

LEAP has become synonymous with New York State requirements for evaluation of compensatory education programs. This formal, computer-based evaluation of students served in funded programs is based on data required annually of all school districts.

LEAP is a comprehensive system, which provides statewide uniform reports so that data can be aggregated in a meaningful way. Leap eliminates the need for duplicative reporting by school districts, and generates the analyses which can be used to determine the effectiveness of compensatory education programs.

LEAP is continually revised to address the needs of those who report and use evaluation data. The reporting format accommodates information which defines characteristics of the individual student, program features, and achievement information. It yields a comprehensive profile of each individual student and provides an information base from which the LEAP analysis reports are generated for school districts and their individual schools.

For example, a LEAP profile helps instructional support staff to track individual student progress on all students in the state's instructional support programs. The individual profiles are useful at the local level for monitoring the achievement of individual students and the aggregation of these data is useful at the building and district levels for monitoring the success of the program.

The specific reports include:

- A total district report.
- A total public school report.
- A total nonpublic school report.
- Individual public and nonpublic school building reports.
- Annual review of effectiveness reports (based on aggregate performance) for individual schools.

The information in these reports helps educators to:

- pinpoint effective programs or programs in need of improvement;
- determine the relative effectiveness of various programs;
- identify key elements in the program;
- aid in the design of program improvements;
- aid in designing effective programs for children with different needs; and,
- determine more effective allocation of resources.

Part 200 Management System for Special Education.

The Part 200 Management System for Special Education is an application developed to administer Committee on Special Education (CSE), Committee on Preschool Special Education (CPSE), and special education operations at the local level. The program is

available in stand-alone micro/mini computer configurations or as an integrated component of the mainframe computer based Student Information System. The Part 200 Management System maintains biographical, family and school information. Additionally, the system tracks all CSE/CPSE events; schedules meetings; generates notices and correspondence; maintains summary and detailed student evaluation information; records CSE/CPSE decisions; generates Phase comprehensive IEPs including annual goals and instructional objectives; manages extensive provider and class section placement information; and generates numerous ad hoc, local, and state reports. The Part 200 Management System is supported statewide by an extensive network of RIC/RCC and Special Education Training and Resource Center (SETRC) personnel and includes complete user documentation.

Financial and Administrative Management for Education, or FAME, System.

The development of a database management system for providing financial management services to school districts has been undertaken at the Erie I BOCES. This development project, entitled FAME, has created a uniform computer-based financial applications system that reflects Statewide data standards and is being made available to all school districts over TNT. Instructional support staff can use FAME for preparing budgets, tracking expenditures, and preparing required financial reports.

The primary features of the FAME system include:

- A single database repository.
- Project tracking capability.
- Generation of on-line reports.
- On-line help capability.
- A system based on general accounting principles.
- Electronic provision of state reports.

The application areas of the FAME system that have been developed and piloted include:

- *General Ledger.* Provides school districts with a cash receipts journal, a general journal, a cash disbursement journal, an account ledger, and other reports and project tracking functions.
- *Revenues.* Provides records of receipts, original estimates, adjustments to estimates, and other reports.
- *Personnel.* Provides a record of personnel data, employment information and other personnel information.
- *Employee Attendance.* Provides a record of employee absence/attendance, an employee calendar, reports, and other pertinent data.
- *Payroll.* Provides budget code breakdowns, pay schedules, and other reports.
- *Accounts Payable.* This is a subsystem, comprised of Encumbrance Accounting, Purchasing, Billing and Bidding.

Other TNT Instructional Support Services.

Job Link, the Teacher Career Recruitment Clearinghouse, and the availability of other databases are TNT services which can be used by instructional support staff for student and teacher career exploration and for accessing resources.

Job Link. The State Department of Labor and the State Education Department through an electronic link have established a computerized job placement and career planning program between area Boards of Cooperative Educational Services (BOCES) and the Department of Labor's Community Services program. The system, entitled Job Link, allows educators to call up current Department of Labor job listings, thus allowing students to get an immediate and accurate picture of the current job market and job requirements. Previously, the only way students could view Department of Labor job listings was to go to a Department of Labor office or a public library.

New York State Teacher Career Recruitment Clearinghouse. The Teacher Career Recruitment Clearinghouse is a database and software system developed for the TNT system to collect and distribute information about teaching job vacancies and candidates. The primary purposes of the project are:

- Collect and maintain data regarding teaching opportunities and qualified applicants.
- Collect and disseminate information concerning employment opportunities for those interested in a teaching career.

A candidate file and a vacancy file were created for the system. The candidate file allows teachers to post on the system their interest and availability in locating a teaching position in New York State's school districts. Teachers enter the following detailed information:

- Certification area;
- Certification type (provisional/permanent);
- Other teaching experience;
- Basic resume facts; and,
- Geographical preference for location of work.

Superintendents of schools and personnel administrators are able to query the candidacy file to locate potential candidates for teaching positions.

The second file, vacancy file, allows school districts to post available vacancies. This file is, in turn, searched by teachers who are seeking employment.

Gateways to Other Networks Electronic connections have been established between TNT and other networks, including INFONET, Apple-Link, BITNET, and the National Science Foundation's Internet via the New York State Research and Educational Network (NYSERNET). The connection to INFONET, IBM's worldwide *Information Network*, dramatically increases the number of services available to TNT users.

For example, INFONET services include:

- Electronic mail to over 80 countries and many U.S. public/private agencies.
- Curriculum projects cooperatively developed by New York State students and teachers and their counterparts in other states and countries.
- Access to over 30 information services(i.e., Dow-Jones, LEXIS, NEXUS, BRS, and others).

The link to Internet provides access to over 3,000 other networks with hundreds of thousands of university and noneducation users nationally and internationally. The connection to Internet allows access to mail and a variety of database and library services.

New York City Board of Education NYCENET. A citywide telecommunications network allows all school personnel to pool information, exchange ideas and communicate with the Central Board of Education and other users. The bulletin board/computer conferencing service makes possible the exchange of messages and is used to find out about hardware, software, contracts, and meetings.

4. COMPREHENSIVE INSTRUCTIONAL MANAGEMENT SYSTEM (CIMS)

"One tenet of the effective schools movement has been the focus upon the building principal as the instructional leader. Last September, as a fledgling administrator, I began to pilot CIMS Mathematics with seven of my teachers. As a result of my training at the CIMS Administrator Staff Development Sessions, I have been able to work with the teachers through the initial survey, data analysis, establishment of instructional timelines, problem-solving workshops, materials selection, and midyear survey with necessary timeline adjustments.

When we began our CIMS Math pilot, we had a number of concerns. But now, with three-fourths of the year behind us, we note that our initial anxieties were totally unfounded. We are looking forward to the final survey and its possible use for both class and individual goal-setting for the coming school year. The system clearly has promoted my familiarity with our mathematics curriculum, and has fostered bonds of communication and collegiality between the pilot teachers and myself.

Teachers also comment favorably about CIMS. Our second grade teachers, all of whom are piloting, have worked closely together to develop and conduct combined problem-solving sessions for their youngsters. Others feel that components of the program encourage appropriate time management, identify individual and class strengths and weaknesses, provide data to support reteaching, and positively reinforce student achievement through the individual student reports."

- Donald Klem, West Side Elementary School

The Comprehensive Instructional Management System (CIMS) is a partnership between the State of New York and local school districts designed to develop local instructional programs. CIMS makes curriculum the key to a successful instructional program. CIMS defines the curriculum as "an ordered set of intended learning outcomes" in which teachers and administrators monitor how effectively these outcomes are met. CIMS has four components: curriculum, assessment, instructional support, and staff development.

Explicit Curriculum and Intended Learning Outcomes.

CIMS conceives of the curriculum as intended learning outcomes. Teachers need to be informed of the outcomes they are supposed to help students attain. This ensures the principal has a basis for determining the instructional programs' success. Teachers within and across grade levels need to share a knowledge of learning outcomes. This increases their capacity to communicate and cooperate among themselves. The curricu-

lum should be specified to ensure that teachers' informal versions of the curriculum do not vary widely. The principal and the teachers must commit to an explicit curriculum; when expectations for a curriculum are jointly arrived at, all parties understand its purposes and can assess its effect.

Assessment that Matches Real Curriculums.

When learning outcomes are explicitly defined, it is possible to assess whether they have been attained. The CIMS approach of matching assessment to the intended outcomes that define curriculum enables teachers to make informed instructional decisions. Learning outcomes focus both teaching and assessment. Rather than comparing students with their classmates on a norm-referenced basis, teachers can assess each student's progress according to an established standard. When the criterion-referenced assessment indicates that a student is not reaching the standard, teachers adjust that student's instruction accordingly.

Curriculum and Instructional Support.

CIMS projects include instructional support materials such as kits, microcomputer software, and paper-and-pencil activities students can use to practice their newly acquired skills. The connection between curriculums and these support materials ensure that the materials match the outcomes.

The integration of curriculum, assessment, and instructional support is managed through a reporting system. At the classroom level, teachers collect and report information on which they base instructional decisions. At the building level, principals use data on pupil achievement to determine whether the program is successful.

The CIMS Curriculum Development Process.

The development process for curriculums in mathematics, reading, communication arts, science, and social studies are similar. In each case, developers began by defining curriculum as intended learning outcomes. In addition, most developers used the existing State Education Department syllabus as a starting point.

CIMS products and procedures are disseminated by original developers to replicator projects by a Transferring Success process. State funding supports the transfer of curriculum, assessment and instructional support from the developers to the replicator through staff development.

5. TOOL APPLICATIONS FOR STRENGTHENING THE CURRICULUM.

"David A. Stein Riverdale J. H. S. 141 is located in a residential urban community in the Northwest section of the Bronx and serves a diverse student population from various socio-economic backgrounds.

Arlene Weinstein, Phil Firsenbaum, and Fran Schwartz are teachers who feel strongly that the computer is a motivator for many students and that computer technology can be used to enhance the writing program at their school. This program is called, 'Team Writing with Computers.'

The writing program for seventh- and eighth-graders is targeted at the Preliminary Competency Test (PCT) preparation for those students who are identified as in need of remediation in writing and language skills.

Students from three eighth grade classes and one seventh grade class are participating in a program of desktop publishing in two Macintosh computer labs.

The desktop publishing applications reinforce concepts that have been introduced as part of the writing curriculum as students practice their editing skills. First drafts are more easily improved and polished in spelling, grammar usage, punctuation, and vocabulary development by using word processing software. Each draft is printed for teacher-student and peer conferencing, and then the final copy is shared and displayed."

- Arlene Weinstein, David A. Stein J. H. S. 141

The *Long-Range Plan for Technology in Elementary and Secondary Education* recommends the use of a wide variety of software tool applications to enhance the teaching/learning process. Examples of tool applications are as follows:

Word Processors.

Word processing is a tool application that is frequently used in instructional support programs. Survey results indicate that 62 percent of the respondents use word processing.

Word processing brings form and polish to the writing process: the computer can store large quantities of text; allow the student to insert, delete, and rearrange the text; match the text against a variety of spelling, punctuation, and word choice "checkers" for accuracy and variety and assist students in "shaping" and "polishing" their work.

Word processing can also enable limited English proficient students whose alphabet differs from that of the English language to write more rapidly than would be possible if the student had to first acquire the alphabet and then write without the use of the computer.

Teachers can use word processing programs to develop standardized report formats, such as a student profile report or a program improvement plan.

"The 'Vision of the Future' outlined by the State Education Department in the Long-Range Plan for Technology is currently being implemented at the Buffalo Science and Mathematics Magnet School in Buffalo, New York.

The Buffalo district is committed to modeling the best practice in the application of technology to the curriculum of the Science Magnet program. Daily access to computer services is available to every student, teacher, administrator, and office clerk on demand.

Access to multimedia and hypermedia data environments is provided. Each grade level computer network is equipped with an interactive laservideo workstation, and LCD panel overhead projection system. CDM and MacRecorder for capturing sound provided students and teachers with a complete multimedia authoring environment for each grade level.

Every student and teacher has daily access to computer tools. They experience technology, not as a specialized area of study, but as a practical tool assisting them in the acquisition, management, and presentation of knowledge.

Instructional staff were provided with home computers and trained to use tool software for integrating technology into the curriculum."

- Joseph Parana, Museum Magnet School

Spreadsheets.

Spreadsheets allow users to easily modify and manipulate numeric data arranged in rows and columns.

Instructional support staff can enter budgetary data into their spreadsheets, easily change various items, and get immediate information on the effect of increases and decreases to the budget. For example, the impact of changes in the cost of textbooks could easily be seen on budget items.

Students typically take advantage of the power of spreadsheets both in science and mathematics.

Databases.

Databases provide a mechanism for the use of large amounts of data. Some uses include quick access to selected items, easy reordering (sorting), and production of custom or routine reports. Databases have been used in social studies and science to allow students to store, update, retrieve, organize, sort, format, and perform computations on data. Students use databases in compiling data from opinion surveys and performing statistical analyses. They provide a concrete means of "if-then" analyses of data so students can actively participate in hypothesis testing, prediction, and model building, the foundation of science and mathematics.

Instructional support staff can benefit from the use of database software in classroom organization by locating students with common interests and on the basis of performance level.

Business Graphics.

Business graphics are used in conjunction with spreadsheets and databases to create charts and graphs illustrating trends and properties of data. Teachers and students use business graphics in preparing reports, research studies, and presentations.

Creative Tools.

Creative tools include painting, drawing, and music programs which allow the user to give personal expression and produce artistic works. Students use these tools for illustrating their literary works.

Computer graphics systems that involve the use of electronic paint brushes and music synthesizers are new electronic tools for students to use to express themselves in art and music. They are also being used to identify and interpret patterns through sight and sound.

Three-Dimensional Rendering Systems and Computer Assisted Design.

Spanning the business graphics and creative tools are three-dimensional rendering systems and Computer Assisted Design (CAD) programs. These are used to design and create physical artifacts for use in business and industry.

NOT NECESSARILY THE NEWSROOM

"Beyond Our World"

Figure 6.8. Student Journal.

Simulations.

Computer simulations have been used in science, mathematics, and social studies to teach complex processes that can not be conveyed to students within a typical educational setting. Simulations can augment science classroom instruction by permitting students to explore worlds too small, fragile, dangerous or complex for actual classroom study. Simulations can provide unique opportunities for the social studies student to assume the role of a person in a simulated historical event. They can also help students understand the "real world" event being modeled.

Multimedia.

Multimedia programs allow students and teachers to develop presentations and reports which integrate text, graphics, sound and motion for illustrating particular ideas or as teaching tools with impact that rivals television.

Desktop Publishing.

Desktop publishing provides a mechanism to produce an integrated text and graphics product which is in attractive and readable format. Figure 6.8 shows a journal of stories written by elementary children and produced using a desktop publishing program.

Personal Telecommunications.

Personal telecommunications packages allow teachers and students to access local bulletin board systems (BBS), providing them with a forum for developing and sharing ideas.

Tool Software Packages.

Tool software packages integrate a number of the above in a single unit allowing for sharing among the subprograms.

6. DISTANCE LEARNING FOR INSTRUCTION AND STAFF DEVELOPMENT.

"Following the implementation of the Commissioner's Regulation, Part 100, requiring that all students begin foreign language study in their middle school years, Walt Whitman High School in South Huntington experienced a decline in the number of students beginning a foreign language in high school. In order to accommodate the small numbers requesting such courses, the school district began investigating distance learning as an option. They initially studied the possibility of offering beginning French through the TI-IN Network, a Federal Stars Schools Project, located in San Antonio, Texas.

Five students enrolled in the pilot program. The district purchased the required equipment, including a TV monitor, a VCR, a printer, and a satellite dish. Students participate in the satellite-delivered program by viewing the teacher on the monitor and engaging in two-way conversations with the teacher over audio links. Tests are administered regularly. Lesson plans, handouts, and testing materials are received by mail to be duplicated as needed."

- Ladislas A. Goldberger, South Huntington U.F.S.D.

Since 1985, a variety of distance learning projects have been undertaken by BOCES and school districts throughout the State. Most projects involve needs and technical feasibility studies. A few projects have actually designed, developed, and implemented distance learning programs for instruction and staff development.

Distance learning systems provide many educational benefits, including: provision of expanded staff development opportunities, opportunities for offering limited-enrollment courses, and homebound instruction delivered to the home. The U. S. Congress Office of Technology Assessment report, *Power On!* underscored the potential benefits of distance learning. "Telecommunications could allow students forced to remain home due to illness or weather conditions to connect with the teacher or with school programs to make up for lost time," stated the report. "Distance learning programs could support isolated populations of students who are underserved in certain subjects."

Distance learning systems typically use communications technologies to link a teacher or student in one school or site to teachers or students to other schools or sites several hundred miles away. The networks provide for some level of interaction between persons at these sites, typically in the form of two-way audio and/or data communications and one-way video transmission. The communications transmission media can include telephone lines, microwave transmission, cable transmission, satellite transmission, fiber optic transmission, and others.

Such courses as calculus, astronomy, and second language instruction have been offered through distance learning, which has also been used to provide staff development to teachers and administrators.

TNT/Distance Learning Grant Program.

A TNT/Distance Learning Grant Program was offered during 1986-88 to BOCES and schools to support planning, implementation, and expansion projects. Nine implementation and eight planning grants were awarded (see Figure 6.9 for the location of the nine implementation projects).

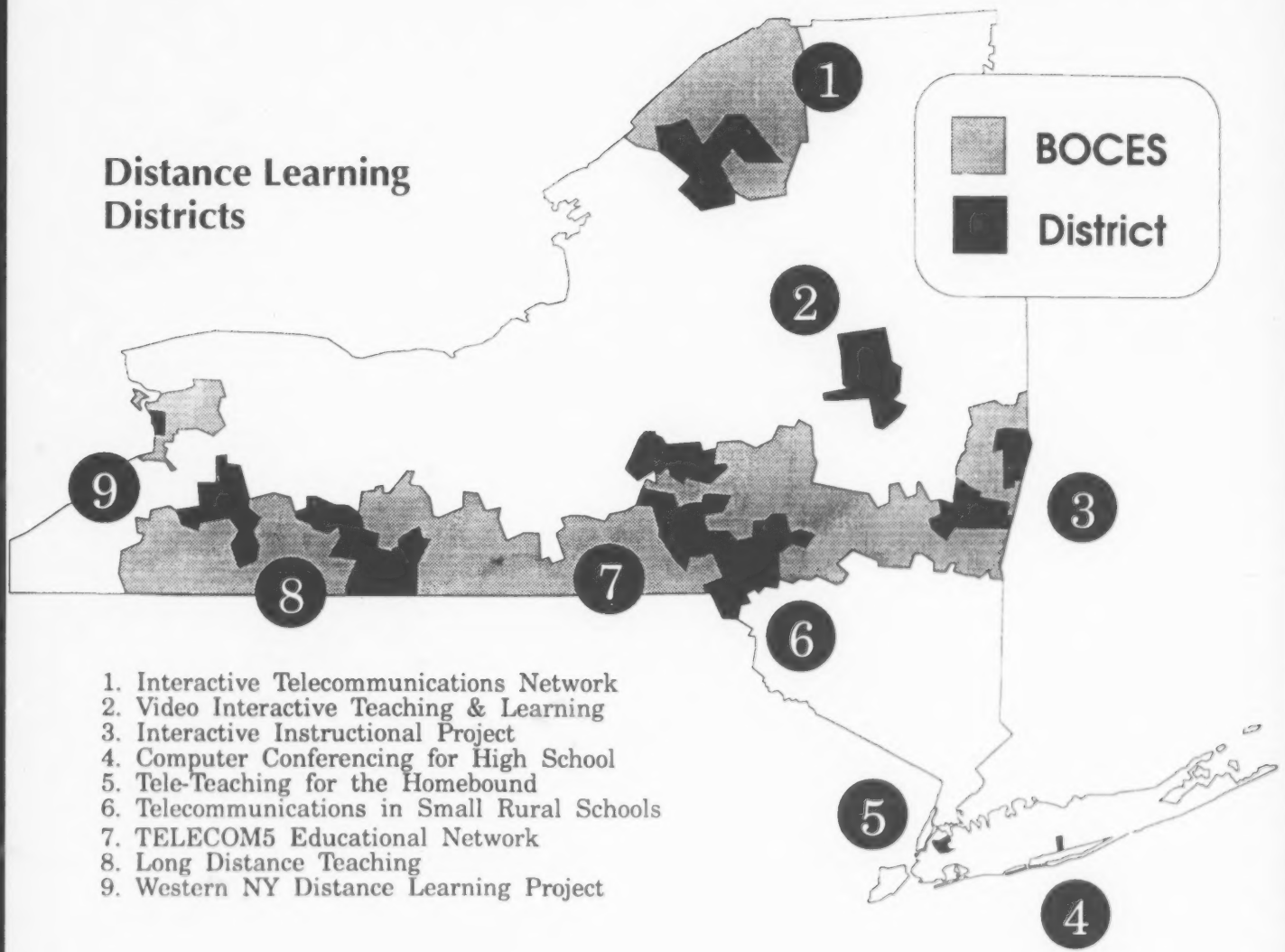


Figure 6.9. Location of TNT/Distance Learning Implementation Projects.

Brief descriptions of the focus and technology system used for some of these projects are as follows:

A. Distance Learning Project in Western New York.

Audiographic Conferencing

The Erie 1 BOCES, Buffalo City Schools, five other schools within the region, and Houghton College use audiographic conferencing to provide AP calculus, specialized and/or enrichment courses to students. This project was initiated to overcome impediments related to geographic isolation, limited enrollment problems, and declining financial resources.

"A cooperative effort between Newark Valley Central School District, Owego-Apalachin Central School District, Tioga Central School District and Broome-Delaware-Tioga BOCES has resulted in the connection of these districts by a fiber-optic cable for student and faculty communication.

Fiber optics was chosen for connectivity in Tioga County because of the topography of the land and the reliability of the fiber optic cable. This cable consists of hair-thin glass filaments which transmit information via light signals. The system is currently sending and receiving audio and video signals.

There are five courses being offered over the system: Shorthand;AP English; Spanish 4; AP Pascal; and AP Accounting. Future plans involve using the system for staff development and for connection to local cable companies for community education programs."

- Dawn Chenier, Broome-Delaware-Tioga BOCES

B. Interactive Telecommunications Network.

ITFS

The St. Lawrence-Lewis BOCES and three school districts were linked through Instructional Television Fixed Services (ITFS) for direct instruction and administrative services. Twelve school districts use audiographic conferencing to deliver instruction to schools

C. Telecommunications in Small Rural Schools.

Audiographic Conferencing

The Delaware-Chenango BOCES and 12 school districts used audiographic conferencing to deliver instruction to schools throughout the region. Advanced Placement Calculus, Spanish, and Creative Writing courses, including field trips to other locations and countries, were delivered over the system.

D. TELECOM 5 Educational Network.

Fiber-Optic

An innovative, comprehensive distance learning program and services has been implemented under TNT funding at the Southern Tier Regional Information Center. The network provides interactive conferences transmitted over a public television signal, video programs, and general information on distance learning. This program has fostered implementation of a fiber-optic 3 school interactive distance-learning network including Owego, Tioga, and Newark Valley. The network will be expanded to include 12 additional school districts, SUNY-Binghamton, Broome Community College, Public TV-WSKG, and the Roberson/Kopernick Science Center. The network will support 2-way conferencing between any combination of locations. It will also accommodate data communications for the RIC and telephone telecommunications.

E. Restructuring to Promote Learning in American Schools.

Public Television

Public television station WNED-TV and five BOCES in the Western New York region have worked cooperatively to provide schools in the region with several interactive staff development teleconferences on restructuring schools. Both urban and rural versions of the teleconferences have been broadcast.

F. Technology Enhanced Special Education for Teachers via Long Distance Learning.

Satellite System

SUNY College of Technology at Utica/Rome, New York, and the State Education Department have collaborated on a project to use the college's Ku-band satellite uplink/downlink transmission system to provide graduate level, credit-bearing special education courses for teachers in New York State.

Instructional support staff may contact or visit these sites to explore potential uses of distance learning systems for their programs.

7. INFORMATION ACCESS AND RETRIEVAL TECHNOLOGIES.

"Another way to routinely access large volumes of data is by using a computer to call an information service at another site. Such data banks are operated by educational institutions and commercial services. They typically use high volume magnetic disk drives to store and retrieve their data.

Information services available to libraries and homes are generally limited to text and still images. They charge reasonable fees and are available via a local call in most cities. Typical services include news, shopping services, electronic mail, stock prices, access to computer graphics, and encyclopedias.

From an instructional point of view, these services can be great for researching student projects and sharing experiences with other students around the world with little added cost for most schools.

As we move into the 1990s, we expect that more instructional applications will take advantage of the new technologies that store huge volumes of information at a single site and move information from centralized facilities to students and staff at sites around the country. We can foresee a not too distant future where a student could view a laser disk located at the Library of Congress without having to go there or waiting for it to come to town."

- Denise and Doug Greene, Binghamton City School District

New storage technologies provide teachers and students with increased access to text, graphics, motion images, and sound. This information can be used to develop presentations, productions, and other reports. Access to these resources enhances student motivation to learn.

Examples of information storage technologies are as follows:

CD-ROM. Compact Disc-Read Only Memory (CD-ROM) is a storage device which provides a user with a large amount of text, graphic, and/or sound information. For example, encyclopedias, science programs, documentaries, plays, and collections of art works, photographs, and slides are today available on CD-ROM for use in school. An advantage of CD-ROM is rapid access to specific information. Also, CD-ROM can store a configuration of motion, sound, text, and still images.

Video Disc. Video disc, like CD-ROM, allows access to large amounts of information (textual, graphic, and sound), with the addition of full motion video. Video disc technology, when connected to a computer with programming software, permits one to control audio and video playback, to add computer generated text and graphics, and to design entire query sequences based upon student responses.

Video discs available today have been produced for use in a variety of subjects and for various age levels. The use of this technology helps to motivate students because the information on a video disc is presented in both visual and auditory modes.

Hypertext/media. Hypertext/media software allows a student to pursue questions or ideas as they occur to the student. For example, while reading a passage, a student might encounter a word about which the student would like more information. The use of this software would allow the student to locate not only a definition of that word, but also a picture and additional sound and motion information. Teachers benefit from these advances in their ability to provide well-constructed lessons using a variety of presentation materials.

TNT/Youth-At-Risk Electronic Clearinghouse (YAR). A Department-initiated program that provides professionals access to research program and resource databases, computer conferencing, and electronic mail, is the Youth-At-Risk Clearinghouse. The YAR Electronic Clearinghouse offers the state's Youth-At-Risk Program and Community Partnership Coordinators services by using the TNT system. These services can provide instructional support staff an efficient system for searching and retrieving information to improve the quality of their programs. The information available in these databases is an invaluable intellectual resource that can be accessed by instructional support staff over the TNT network.

A user can order TNT's software system to search the databases for specific information, retrieve the abstracts that have been located, and compose reports. An initial development activity was the establishment of criteria for selecting material to be included in the databases. Publications including SED guides, local curricula, videotapes, research documents, and federal documents exemplify the range of information that was included in the Resources Database.

The Resources Database now holds approximately 6,470 documents. Examples of some of its topics include academic remediation of high-risk students; parenting education; drug-and alcohol-abuse prevention and early intervention education; adolescent pregnancy-prevention education; suicide-prevention education; child-abuse-prevention education; and, preventive health services and research related to successful programs for high-risk students.

The Resources Database includes information from other existing databases, including a health database (2,606 documents), a database of information related to individuals with disabilities (1,405 documents), and an adult education database.

A record in the Resources Database includes information on the source for locating the availability of the actual document; the title; author; format (video or book); and the library catalogue number, availability and brief abstract of the document. A user can search the database by one or more fields, retrieve a record or several records and prepare a report.

Figure 6.10 is an example of a research abstract from the Resources Database.

Collection code:	YAR
Publisher:	National Center for Research in Vocational Education, Columbus, OH
Title:	The Helping Process and A Powerful Combination for Dropout Prevention
Abstract:	The first part of this videotape deals with a narrator summarizing effective strategies for keeping students in school. The team approach is exemplified by people working together for the sake of the student. If the student decides to stay in school, he or she should be involved in the helping process whereby an adult is aware of the student's needs and can work toward a goal with the student. A team consisting of a friend, teacher, community representative, principal, and counselor could help the student plan a goal, keep an eye on the student's progress, and help the student attain the goal. The student is asked to find encouragement and support and ask for help. The second part of this videotape deals with "A Powerful Combination for Dropout Prevention." The narrator brings out points of parents, teachers, business and community working together with the student, and students helping themselves to make better choices. A high school's efforts are profiled. Parent volunteers, flex-time scheduling for the students, in-school programs assisting the students, and business efforts for helping students get a job are emphasized.
Descriptor:	MENTORS, DROPOUT PREVENTION, SCHOOL COMMUNITY RELATIONSHIP, DECISION MAKING SKILLS, SELF ESTEEM
Format:	VIDEOTAPE
Corporate author:	National Center for Research in Vocational Education (Columbus, OH)
Series title:	Dropout Prevention Series
Availability:	Publications Office, National Center for Research in Vocational Education, The Ohio State University, 1960, Kenny Road, Columbus, OH 43210-1090. $39.50/set
Notes:	Part of a seven-part set; see Y 78 through Y 84
Year:	1988
Price:	$25.00

Figure 6.10. Research Abstract from YAR Resources Database.

The second database developed as an application of the YAR Electronic Clearinghouse is the Programs Database. It includes information on in-state and out-of-state Youth-At-Risk programs. A record in the Programs Database includes the following: the YAR program contact; the title of the project; address of the site; an abstract of the major purpose and activities of the site; and, funding information. Successful working New York State or national youth-at-risk programs are included in the Programs Database, which now totals 161 documents.

Nearly 1,000 clearinghouses, foundations, corporations, and other state education departments throughout the nation have been asked to complete profiles of their technology initiatives with youth-at-risk. New records are continually being added to the database as a result of this inquiry. Figure 6.11 is an example of a document located by a user in the Programs Database. This database provides invaluable site contacts for instructional support staff to visit as they plan their programs.

EPSIS Accession No.:	P00150
Collection Code:	YPROG
Program Title:	Binghamton School Partnership Project
School/BOCES/CBO:	SUNY at Binghamton
Address:	LNG 275 PO Box 6000 Binghamton, NY 13902-6000
Program Phone:	607/777-4604
Program County:	Broome
Contact Person:	Ian M. Evans Karen Bromley
Contact Phone:	607/777-4604
Program Type:	Dropout Prevention Parent Involvement School College Programs
Target Population:	Preschool Children Elementary School Students Parents
Program Dates:	September 1, 1990 - June 30, 1991
No. of Participants:	60
Language Served:	Spanish Thai Arabic Jamaican
Grade Levels:	Pre-K K-3
Sponsoring Agency:	New York State Education Department
No. of Sites:	2
Funding Amount:	
Funding Source:	State
Notes:	New York State Education Department's Stay in School Partnership Program
Abstract:	It is widely recognized that involving parents in the educational process is one of the most important ingredients for creating effective school environments. Parent participation and the building of an active partnership between families and teachers is a major goal of the Binghamton School Partnership Project (BSPP), a New York State funded dropout prevention program. BSPP is currently conducted in three Binghamton elementary schools: Benjamin Franklin, MacArthur, and Woodrow Wilson. The Binghamton School Partnership Project, a partnership between the State University of New York and Binghamton City School District, works with facilities, teachers and other school personnel to provide children with positive early school-related experiences.

Figure 6.11. Document from YAR Programs Database.

8. VIDEO/BROADCAST TECHNOLOGIES FOR EXPRESSION, INFORMATION, AND SHARING.

"Panama Central School has formed a partnership with Dynacom, Inc., Southbend, Indiana. This partnership enables Panama Central School to be the premier site on the east coast for Dynacom, Inc.'s Video Information System (VIS). VIS is a general purpose presentation system which enables full-motion video to be transmitted, via fiber optics, to 66 instructional areas in the school building.

All video tapes and films will be broadcast from a central distribution room. This system will eliminate the need to search for a needed film projector or TV monitor with a VCR connected to it. It will allow a teacher to access up to three different video sources in one class period.

For example, a teacher can use two different video tapes and a 16 mm film to enhance discussion of a particular topic. VIS will supplement teaching by allowing teachers to bring information into the classroom and control it according to their needs."

- Raymond Fashano, Panama Central

Video technologies are widely used by New York State teachers for enriching the classroom learning experience. Data gathered through the annual Basic Educational Data Systems (BEDS) School Data Form survey indicate that the total number of public and nonpublic teachers using video either occasionally or regularly for instruction increased from 91,605 in 1989-1990 to 97,577 in 1990-1991. The number of public and nonpublic schools using video production for augmenting classroom instruction expanded from 1,578 to 1,686 during the same period.

Other examples of widespread use of video in the classroom in 1990-1991 are:

- 30,900 video cassette playback/ recorders have been acquired;
- 52,905 television receivers have been purchased;
- 4,825 schools receive public television; and,
- 3,148 schools have cable television reception.

Instructional support staff can use video programming and production technologies to expand student learning experiences and to provide them with new means to express themselves.

New York State's Public Television System.

There are nine public noncommercial television stations funded by New York State. They are interconnected and can broadcast simultaneously. Additionally, WNYE-TV Channel 25 and WNYC-TV Channel 31 are not in the New York System, but do provide instructional television programming. This system provides both instructional and general audience programming. Instructional programming supports specific instructional objectives in a curriculum. General audience programming includes public affairs, educational, cultural, and informational programs.

The public television stations provide approximately 200 instructional television (ITV) series to New York State's schools each year for use in the classroom. These programs extend over a wide range of curricular areas. Some are produced by local stations, while the majority are acquired by stations from public and private producers. Figure 6.12 shows the locations of New York State's public television stations.

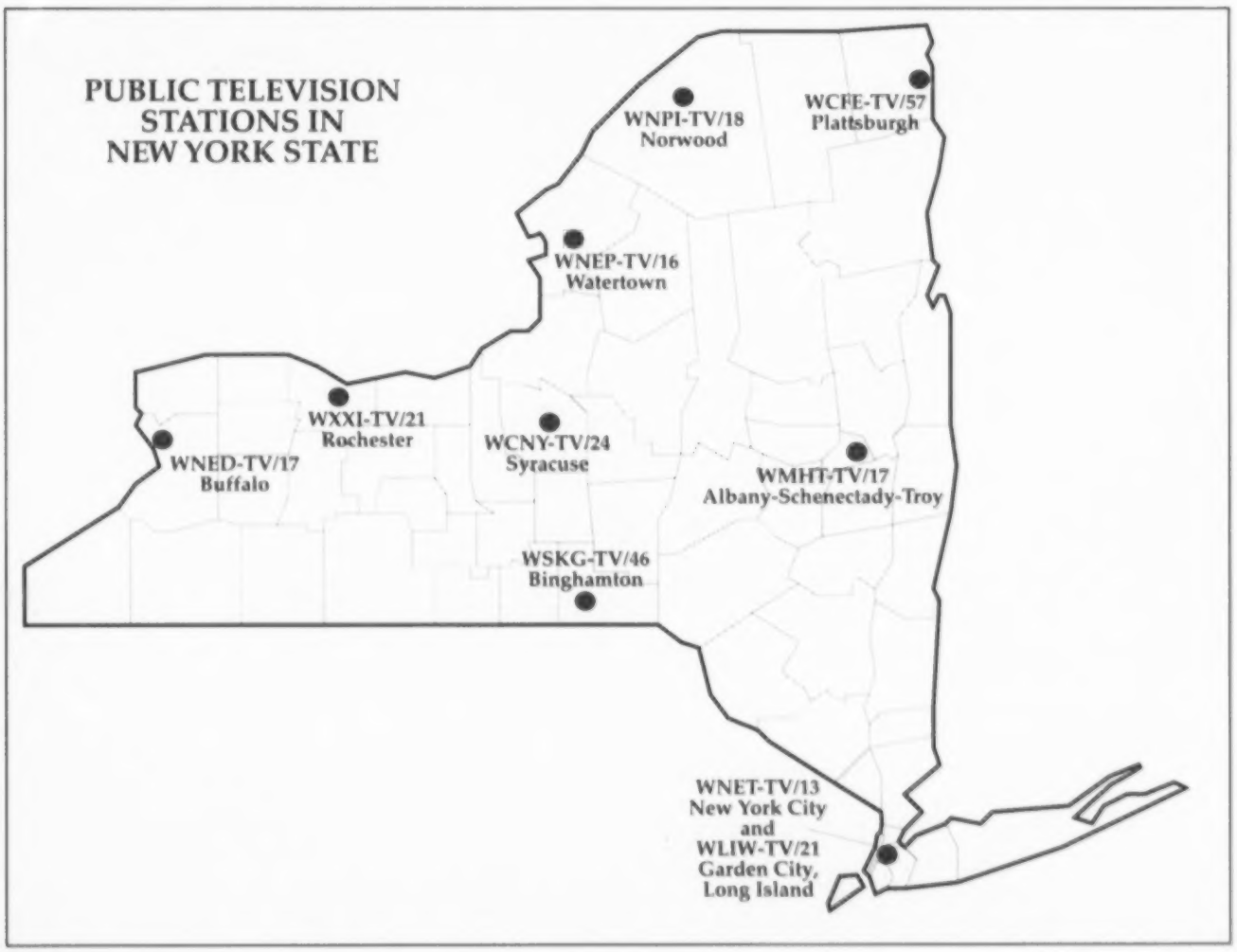


Figure 6.12. Location of New York State Public Television Stations.

Videotapes.

Schools also purchase or receive instructional programming in the form of videotapes from libraries and other collections. Videotapes are presently available from a variety of different sources, including Boards of Cooperative Educational Services, off-air duplication, and direct purchase of video cassettes. The results of the Basic Educational Data System (BEDS) School Data Form survey for 1990-1991 indicate the major sources of video programming to schools:

- 2,301 schools receive video programming from BOCES;
- 3,061 schools use off-air programming; and,
- 4,540 schools directly purchase video cassettes for use in instruction.

"Three Catholic educational systems in New York State have been operating large Instructional Television Fixed Services (ITFS) since the early 1960s. The Brooklyn Diocese ITFS system covers the counties of Kings and Queens in New York City; the Archdiocese of New York's ITFS system covers Staten Island, Manhattan, the Bronx, and several suburban counties up to the city of Poughkeepsie; and Rockville Center's ITFS system extends to Nassau and Suffolk counties on Long Island.

ITFS was set up by the Federal Communications Commission for exclusive non-commercial educational use in schools. It permits a local system to broadcast up to four closed circuit TV channels, simultaneously. Instructional programs may be acquired from national libraries and/or created locally if the system is equipped with a production studio.

In Brooklyn, instructional services are provided to many different audiences. Elementary teachers receive a choice of more than 80 different programs weekly in all content areas and in all grade levels."

- Msgr. Michael Dempsey, Diocese of Brooklyn

Video Production.

The video cameras and videotape recording decks available today are lightweight, extremely mobile, and easy to use. During the past decade, the cost of purchasing video production equipment has significantly declined. The School Data Form survey for 1990-1991 shows over 1,600 public and nonpublic schools currently using video production system in their classrooms. Examples of uses include:

- Students use video production equipment to document contemporary social and historical events in their communities, to record interviews with experts, or to produce their own in-school news broadcasts.
- Students acquire research, writing, and communications skills through the process of developing a script and producing a video production for presentation.
- Students enhance their creative expression by producing a video program of a poem, work of fiction, or a play that they have written.

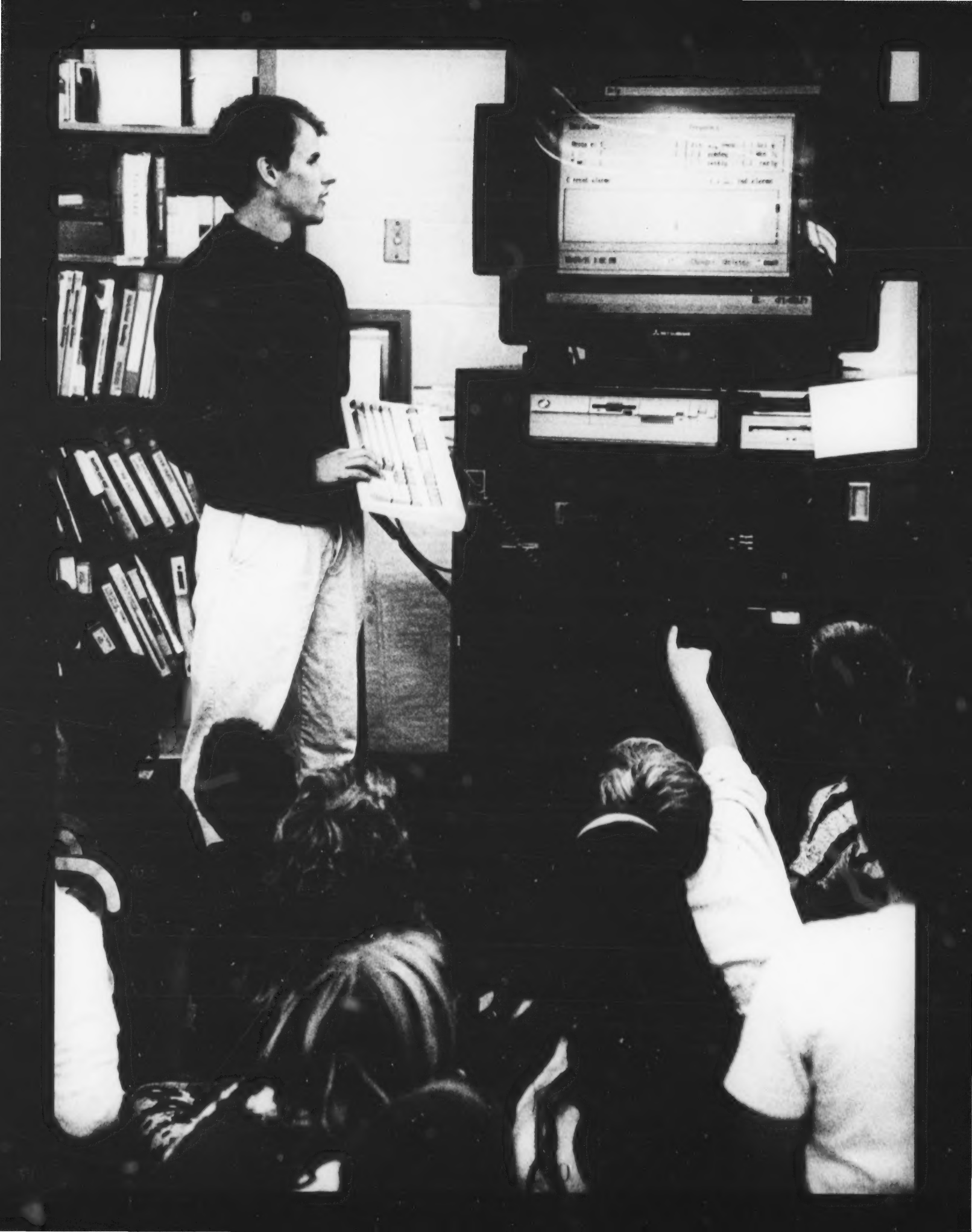
Summary.

Chapter 6 describes several major technology initiatives that can be used by instructional support staff for strengthening the quality of their programs, promoting congruence, and achieving desired outcomes.

The major technology applications described in this chapter are:

- The Technology Network Ties System.
- Electronic mail and computer conferencing for sharing information.
- Management applications such as SIS, ATS, TRACKER, LEAP, FAME and the Part 200 Management System for Special Education.
- The Comprehensive Instructional Management System.
- Instructional software applications.
- Distance learning.
- Electronic databases, including YAR.
- Video technology.

Instructional support staff can access and use these programs to improve their services for students. A well-coordinated plan for integrating these programs within the building can enable instructional support staff to enhance classroom management and instruction.



INDUSTRY PARTNERSHIPS

The State Education Department recently entered into several major industry partnerships to help school districts pilot the *Long-Range Plan for Technology* within their classrooms. IBM Corporation, Apple Computer, Inc., Data General Corporation, NYNEX, and Microsoft Corporation have contributed significant amounts of hardware, software, network technology, technical assistance, and training to selected schools throughout the state.

The corporations forged these partnerships because their strategic plans complement the *Long-Range Plan's* vision of the future role of technology in education. They recognize that the statewide Technology Network Ties (TNT) system is a comprehensive foundation for restructuring education.

The industry partnership sites serve as models which instructional support staff can visit to observe how comprehensive technology planning, staff development, and tool applications of technology have been implemented to improve the teaching/learning enterprise. The sites have employed a TPIS model in formulating their plans and have used the Model Schools approach in training their administrators and teachers.

The total value of the resources contributed by the companies is $12.75 million. At present, 26 school districts throughout the state participate in the partnerships. Figure 7.1 shows the location of each of the sites. Figure 7.2 indicates the number of districts selected for each partnership.

The partnerships directly impact over 19,000 students in the 26 sites. Over 2,000 Chapter 1 students attend these schools. Figure 7.3 shows the regional distribution of the partnership sites.

Figure 7.4 shows the number of Chapter 1, Free Lunch, Limited English Proficient (LEP), and special education students in the partnership sites.

STATE EDUCATION DEPARTMENT/IBM JOINT STUDY PARTNERSHIP PROGRAM.

In April 1990, Governor Mario M. Cuomo announced a partnership with IBM Corporation intended to position New York schools at the forefront of technology. "This exciting new partnership between business and education will provide our students with access to the cutting edge of educational technology," said Governor Cuomo. Twelve elementary schools were selected to participate in the Joint Study project. A pre-

SED/Corporate Partnerships

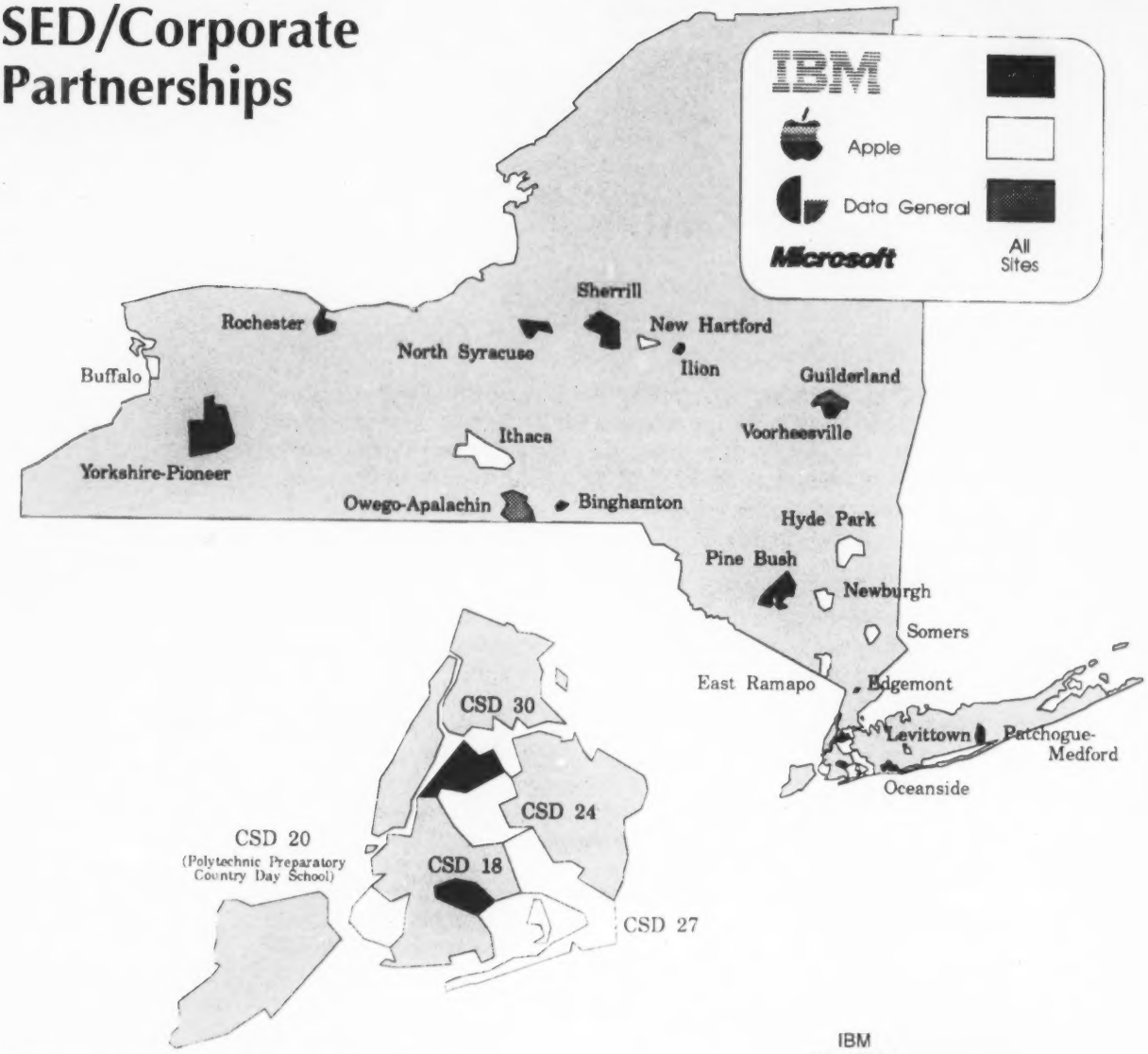


Figure 7.1. Location of Industry Partnership Sites.

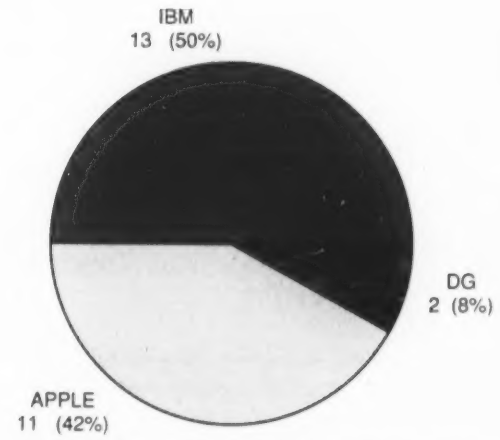


Figure 7.2. Number of Districts in Each Partnership (total N=26).

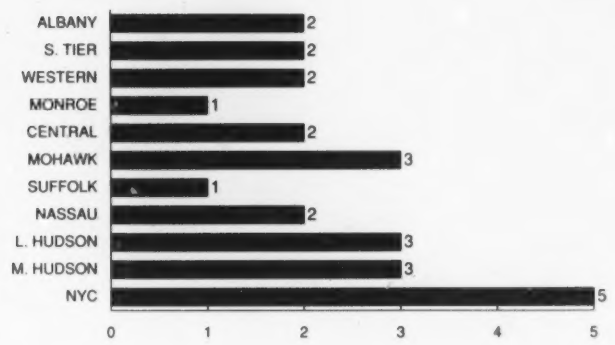


Figure 7.3. Number of Partnership Sites in Major Geographical Regions (total N=26).

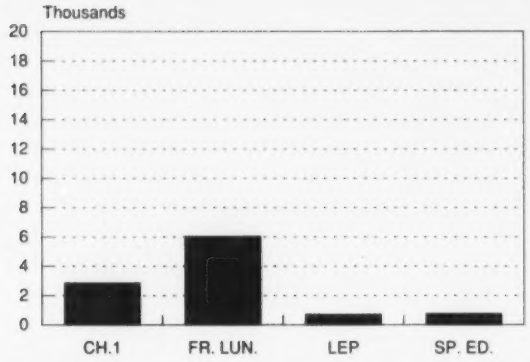


Figure 7.4. Number of Chapter 1, Free Lunch, LEP, and Special Education Students Enrolled in the Partnership Sites (total N=19,039).

Joint Study pilot site was also established at a 13th site. The schools will collect and publish data on the use and effects of technology on student learning and school operations. "The study will last six years," said Commissioner Sobol. "From it we expect to learn a great deal about how technology can be used to improve achievement, and about how we should organize schools and classrooms to harness its power effectively."

The 13 schools selected to participate in the Joint Study exemplify a wide range of technology projects, educational programs, and the State's regional diversity. The schools are as follows:

1. Patchogue-Medford School District, Eagle Elementary School. Eagle Elementary School, in Suffolk County, is a K-6 building with 751 students. The school's library system is extensively networked. Eagle is a pilot for the Regents Excellence and Accountability Program.

PROJECT FOCUS
Use technology for improving teaching strategies and student performance.

There are seven Writing to Read laboratories in the district. Eagle's library system uses computers for accessing information databases. Eagle is currently connected to TNT. The grant will help Eagle Elementary school identify new ways for using technology to improve teaching strategies and student performance.

2. Oceanside Union Free School District, School #8. School #8 is a K-6 building with 519 students located in Nassau County. The Library/ Media/Computer complex provides comprehensive support for its educational program.

PROJECT FOCUS
Use networked computers to implement Oceanside's "Technology Plan for Excellence."

The district's "Technology Plan for Excellence" was guided by the *Technology Planning for Improving Schools* (*TPIS*) model and the *Long-Range Plan for Technology*. Oceanside is using its grant to extend technology to all classrooms and achieve its long-range plan technology objectives.

3. New York City Community School District 30, Public School 76. Located in Queens, Public School 76 is a K-6 building with an enrollment of 7,654 students. The school recently became the district's Computer and Communications Arts Center.

PROJECT FOCUS
Use technology and networks to develop innovative strategies for the integration of technology within all classrooms.

Creative use of educational technology has been at the core of PS 76's educational programs. The Joint Study grant is helping the district develop innovative strategies for the integration of technology within all classrooms.

PROJECT FOCUS
Expand the Multimedia Demonstration Project and the district's vision of the future throughout PS 235.

4. New York City Community School District 18, Public School 235. Public School 235, located in Brooklyn, is a K-6 building with an enrollment of 1,327 students. This school received State and national recognition for initiating a Chapter I CIMS mathematics program under the Federal Secretary of Education's initiative for projects meeting the special education needs of disadvantaged children.

A Multimedia Demonstration Project was funded at the district by the Department of Education under the Fund for Innovation in Education: Computer-Based Instruction Program. The Joint Study grant will help the district extend their vision of the future into PS 235.

PROJECT FOCUS
Use computer networks to enhance the teaching of music, English, and English-as-a-Second Language, including all other disciplines.

5. Edgemont Union Free School District, Greenville School. Located in Westchester County, the Greenville School is a K-6 building with an enrollment of 345 students. Greenville is using a computer-based encyclopedia to enhance the teaching of English, music, and English-as-a-Second Language.

Greenville is using their grant to improve teaching/learning across all disciplines.

PROJECT FOCUS
Expand the district's effective technology program through networked classrooms and increase access to the Writing to Read program.

6. Pine Bush Central School District, Pakanasink Elementary School. Pakanasink Elementary is a K-4 building with a student enrollment of 586 serving Orange, Sullivan and Ulster Counties. Pakanasink's *Writing to Read* program was so well received by students, staff, and parents that it gained recognition and support throughout the district.

The IBM Joint Study grant award has enabled Pine Bush to expand upon its effective technology program.

PROJECT FOCUS
Achieve full integration of computers, software and communications technologies within the district's entire educational program and increase access to Model Schools and CIMS science.

7. Voorheesville Central School District, Voorheesville Elementary School. Voorheesville Elementary School, located in Albany County, is a K-6 building of 667 students. This school has a Model Schools Program and was one of the State's developer districts of CIMS science.

The award has helped the district fully integrate computers, software, and communications technologies within its entire education program.

PROJECT FOCUS
Employ networked computers for expanding CIMS, TNT's electronic mail, CoSy computer conferencing, Model Schools, and Writing to Read.

8. Ilion Central School District, Remington Elementary School. Remington Elementary School is a K-6 building of 576 students located in Herkimer County. Remington has developed a comprehensive technology program out of its long experience in using CIMS, PROFS electronic mail, CoSy computer conferencing, the Model Schools Program, and the *Writing to Read* program.

Remington is using its grant to extend access to these and other promising technology programs to all teachers and students.

9. North Syracuse Central School District, Cicero Elementary School. The Cicero Elementary School is a K-4 building with 668 students. Cicero's professional staff developed a comprehensive technology plan for the building based on the Department's *Technology Planning for Improving Schools* model.

The district also participates in Model Schools and is linked to TNT for communications. The IBM Joint Study grant has made it possible to implement Cicero's full vision of the future throughout the school.

PROJECT FOCUS
Use computers and TNT to implement the district's technology plan modeled after TPIS and Model Schools.

10. Binghamton City School District, MacArthur School. The MacArthur School, a K-6 building of 570 students, has been designated as a "Schools as Community Sites" school by the State Education Department. The School's *Writing to Read* program and other technology projects have been designed to strengthen the school's ties to the community.

PROJECT FOCUS
Strengthen the school's ties to the community through the use of telecommunications in the district's Schools as Community Sites program.

11. Rochester City School District, School #14. School #14, a K-6 building with 572 students, was designated by the district as a "Teaching and Learning with Computers" site. Computers have been used to support the teaching/learning environment of the school. For example, Limited English Proficient students have significantly improved their reading and math scores during the past three years.

The computer resources and training received under the grant extend the reach of technology into every classroom.

PROJECT FOCUS
Use computer classroom networks to expand the schools's Teaching and Learning With Computers program into other buildings.

12. Yorkshire-Pioneer Central School, Arcade Elementary. Arcade Elementary Building is a K-4 building with an enrollment of 736 students. Located in Cattaraugus County, Arcade has a *Writing to Read* program and an operating distance learning project that uses satellite technology. Arcade's fourth grade produces a broadcast television news program.

Arcade is using its grant to complete the full integration of technology within their classrooms.

PROJECT FOCUS
Integrate Writing to Read, distance learning, and computer networks into a comprehensive technology program to enhance the teaching/learning enterprise.

13. Sherrill City School District, Wettel Elementary. A pilot project was established at the Wettel Elementary School, Vernon-Verona-Sherrill School District, located in Herkimer County, New York. This pilot has provided local site staff, State Education Department representatives, and IBM Branch Office staff a unique opportunity to plan and refine the program that will be extended to the 12 Joint Study schools.

PROJECT FOCUS
Serve as the pilot site for planning and refining the components of the Joint Study Program.

The statewide TNT network is the major vehicle for communications and information sharing among the Joint Study sites, BOCES Regional Centers, the Department of Education, and IBM Branch Offices. By September 1990, network connection between the school sites and the designated TNT connection point at the appropriate BOCES Regional Center had been established for all sites. Each site's administrative staff has established PROFS accounts for electronic mail. Key site staff communicate on a daily

basis to ensure successful implementation of their Joint Study project. All sites also established CoSy computer conferencing accounts to discuss specific topics.

Staff development was conducted at each site by IBM Corporation and Department staff. The program trained site teachers on the use and integration of technology in the classroom based upon the Model Schools Program.

The Joint Study project, conducted over six years, is intended to document three major areas:

- The power and benefits of electronic networking among students, teachers and administrators.
- Student, teacher, and administrator use of technology.
- Long-term effects of technology on students, teacher roles, and parents.

Student, teacher, administrator, and parent surveys were distributed in May 1991 to all of the sites as a preliminary step for documenting these effects.

STATE EDUCATION DEPARTMENT/APPLE COMPUTER, INC. PARTNERSHIP PROGRAM.

In September 1990, Commissioner Sobol approved a partnership between the State Education Department, Apple Computer, Inc., Boards of Cooperative Educational Services (BOCES), and school districts. "The New York State/Apple Computer, Inc. partnership will complement the *Long-Range Plan for Technology* by providing enhanced support for the teaching/learning process," said Jack Murphy, Vice President for Apple's Eastern Operations. "I believe the project will assist in the development and implementation of the recommendations Commissioner Sobol has made to the Board of Regents in the *New Compact for Learning*."

The partnership includes two major phases.

Five Phase 1 schools were selected by Apple Computer, Inc. in the summer of 1990 to receive a significant amount of computer hardware, software, training, and technical assistance to implement the vision of the future use of technology shared by the State Education Department and Apple Computer, Inc.

PROJECT FOCUS
Expand the district's network and provide increased access to computer resources

1. Buffalo City Schools, Buffalo Science Magnet School/PS 59. PS 59 is Buffalo's Science and Mathematics Magnet School. There are 883 students currently enrolled in PS 59.

PS 59 installed its first Apple lab of approximately 30 workstations in 1983 to provide students with word processing and database applications in support of the learning environment. Since then, 260 Macintosh workstations have been installed throughout the school's elementary building to provide comprehensive instructional and management functions.

All workstations are connected by a fiber optic EtherNet backbone to a central facility consisting of file servers, modems and CD-ROM drives. This provides communications to remote sites and access to electronic databases. A high-speed data connection links the Zoo and Museum components of the Magnet School program and provides connection to Technology Network Ties (TNT) from all workstations.

The technological resources and assistance received by PS 59 as a Phase 1 project will enable the school to continue to expand their network and provide increased access to computer resources for students and educators.

2. Levittown Union Free School District, Gardiners Avenue School. Gardiners Avenue Elementary School, located in Nassau County, is a K-6 building with an enrollment of 607 students.

PROJECT FOCUS
Serve as the district-wide pacesetter in the use of computer technology for communications and instructional applications.

Levittown's future "vision" of technology was guided by the State's *Long-Range Plan for Technology* and the *Technology Planning for Improving Schools* (*TPIS*) model. Gardiners Avenue Elementary School has been designated a Learning Society Pilot School by the district. Such leading software developers as ABC News Interactive, Optical Data Corp., Scholastic, and Josten's Learning Corporation will use the school development site for their newest applications.

Gardiners Avenue Elementary School will use their SED/Apple Computer, Inc. partnership grant to serve as:

- A district-wide pacesetter in the use of computer technology for communications and instructional applications.
- A forerunner in the uses of technology envisioned in the *Long-Range Plan for Technology* for other school districts throughout Nassau County.
- An innovator in the use of telecommunications to connect senior citizens as electronic "computer pals" from Levittown Memorial to students in the district.

3. Somers Central School District, Somers Middle School. Somers Middle School, located in Westchester County, is a 6-8 building with an enrollment of 550 students. Since 1985, Somers has installed over 80 Macintosh computers in each of their curriculum areas, including the establishment of two Macintosh labs. Students and teachers use the computers as tools to support learning in the classroom.

PROJECT FOCUS
Use computer telecommunications networks for accessing databases and increasing communications.

A building-wide network, consisting of five networked computer zones, was established in 1987 to link together the different geographic areas of the school building for communications and resource sharing.

Somers has installed the following telecommunications links to provide access to databases of information and communications over regional, state and national lines:

- Students are linked through an AcuWeather network to weather stations throughout the country, enabling them to receive raw data on weather conditions from national, regional or local weather stations.
- Students explore different on-line databases, including databases of sports records, through commercial networks. When specific records are retrieved, they are located within student-developed databases.
- Somers Central School District's computer coordinators use AppleLink to communicate with other technology coordinators.

4. New York City Community School District 27, Public School 105. Public School 105, located in Far Rockaway, Queens is K-5 building with an enrollment of 906 students. PS 105 is a Chapter 1 school, with 96 percent of the students below the poverty level.

PROJECT FOCUS
Expand the impact of the district's Student to Student project by providing additional computer resources to support classroom instruction, collaboration, and problem solving.

In September 1989, a Student to Student telecommunications project was initiated by the district to link a 5th grade classroom in PS 105 to a 5th grade classroom in PS 108, which is located in South Ozone Park across Jamaica Bay from Far Rockaway.

The students at both schools have used networked Macintosh computers to exchange book reports, creative writing assignments, and social studies projects based on their family histories. Students use graphics to enhance anecdotes, folklore, and ethnic family recipes.

The Phase 1 Apple grant will expand the impact of the Student to Student project by providing additional computer resources to support classroom instruction as envisioned by the *Long-Range Plan for Technology* and Apple Computer, Inc.'s *Learning Society*. Networked computers will be used in PS 105 as tools to increase communications, collaboration, and problem-solving. These will be indispensable skills for preparing students to live and work in the 21st century.

PROJECT FOCUS
Employ networked computers and TNT connectivity to implement the Balmville Project for enhanced learning, teaching, and educational management.

5. Newburgh City Schools, Balmville School. The Balmville School, located in Orange County, is a K-6 building with an enrollment of 262 students.

Newburgh City Schools is currently embarking upon *The Balmville Project* which will integrate technology in support of learning, teaching, and educational management. The award of the SED/Apple Partnership Project will be a catalyst to help the district implement this project at Balmville.

Two activities will be initially launched. First, a plan has been developed to saturate Balmville's learning environment through the use of technology. Teachers, administrators, and instructional support personnel have actively participated in the development of a comprehensive technology plan. Secondly, Balmville is embarking upon the design and implementation of a Multi-Media Learning Center. Students will be able to use the Center to create their own presentations using video tapes, compact disc, laser disc, and projection equipment. It is anticipated that Balmville students will build their multimedia presentations sequentially over a three-grade span around a central curriculum theme.

Six school districts were selected to participate in the first cycle of the State Education Department/Apple Computer, Inc. Phase 2 Partnership Program.

PROJECT FOCUS
Develop technology-rich science units for students in Boynton and Dewitt Middle Schools.

1. Ithaca City School District, Boynton Middle School and Dewitt Middle School. The Phase 2 project at the Ithaca City School District includes the Boynton Middle School, which has an enrollment of 530 students, and the Dewitt Middle School, which has an enrollment of 635 students. Both sites are sixth to eighth grade schools.

The district has developed a long-range technology plan based upon the State Education Department's *Technology Planning for Improving Schools* (*TPIS*) model. Both middle schools are currently connected to Technology Network Ties (TNT) for electronic mail. The project coordinator uses TNT's computer conferencing capability to communicate throughout the region and State.

Ithaca will use the resources received through this partnership to develop technology-rich science units for students in both middle schools. The technology-based science units are intended to engage students in teacher-designed and small group-designed

research problems that complement the directions set forth in the State's *Long-Range Plan for Technology in Elementary and Secondary Education in New York State.*

2. *East Ramapo Central School District (Spring Valley), Hillcrest Elementary School and Hempstead Elementary School.* An intermediate school and a primary school will serve as the project sites in East Ramapo's Phase 2 project. Hillcrest Elementary School is a four-six building with an enrollment of 384 students. Hempstead Elementary is a primary school that includes grades K-three and a total enrollment of 492 students.

PROJECT FOCUS
Use computer workstations/tool software for the enrichment of content and problem-solving objectives for third and fourth grade students in Hillcrest and Hempstead Elementary Schools.

The district is a pilot district for the State Education Department's Excellence and Accountability Program (EAP). East Ramapo also uses the Comprehensive Instructional Management System (CIMS) Social Studies Program for all students in grades one through six.

Currently, East Ramapo's central offices are connected to TNT for electronic mail and computer management services. Plans are underway to connect individual school buildings in the district to TNT through the BOCES Regional Information Center.

Third and fourth grade students in the two project sites will use computer workstations and tool software received as part of their Phase 2 project, to enrich their understanding of content and problem-solving objectives throughout the curriculum. Teachers will be linked to their colleagues across the State using the TNT network.

3. *Hyde Park Central School District Haviland Junior High School* The Haviland Junior High School, which includes grades seven and eight and has an enrollment of 594 students, is the selected site for Hyde Park Central School District's Phase 2 project.

PROJECT FOCUS
Employ multi-media and hypermedia to design an interdisciplinary curriculum for students at the Haviland Junior High School.

Hyde Park has developed an extensive staff technology inservice program, in which 30 professionals have received a 60-hour program in hypermedia. In addition, the district has provided a six-day technology institute entitled "Bridges to Understanding," which includes training on using laser disk applications in the curriculum.

The district is an Excellence and Accountability pilot site and plans have been developed with the BOCES Regional Information Center to link all district offices and instructional labs to TNT.

The Phase 2 project will provide Haviland's teachers and students with multimedia and computer network resources for designing an interdisciplinary curriculum at the middle school leve'. The project plan supports the recommendations of the State's *Long-Range Plan for Technology* and Apple's *Building a Learning Society.*

4. *New Hartford Central School District, New Hartford Senior High School and Oxford Road Elementary School* A high school and an elementary school will be linked electronically in the Phase 2 project at New Hartford Central School District. The New Hartford Senior High School is a 10-12 building with an enrollment of 663 students. The Oxford Road Elementary School includes grades K through 6 and has 345 students enrolled.

PROJECT FOCUS
Use clustered workstations to link three classrooms at New Hartford Senior High School with a fourth grade classroom in Oxford Road Elementary School for communications and resource sharing.

New Hartford has been a Model Schools district for the past three years and has participated in regional training on the *Technology Planning for Improving Schools* (*TPIS*) model. New Hartford is a test site for the *Aristotle/AppleShare* network and is currently connected to TNT for electronic mail and computer conferencing. The district's teacher center has trained 80% of the staff on tool software applications.

The Phase 2 project at New Hartford uses clustered workstations to link three classrooms at the high school with a fourth grade classroom in the elementary school for communications and resource sharing.

PROJECT FOCUS
Use multi-media and communications technology to help elementary students in PS 81 prepare research reports reflective of their learning styles.

5. New York City Community School District #24, Public School 81. Public School 81, in Community School District #24, is a K-5 building with 1,072 students enrolled. PS 81 has installed computer centers in four grade three and four classes and is currently implementing a separate multimedia center using interactive laser discs, CD-ROM, and video technology.

The district has an extensive Compensatory Education and Congruence Program and is being wired for the Automate the Schools (ATS) project, which will allow access to electronic mail and the entire TNT statewide network.

In addition, the school has a Writing to Read lab for first and second grades and a Thinking Network lab for students in grades 3-5 which will be networked with classroom computer centers.

This Phase 2 project will provide resources for students' use of multimedia to prepare research reports in a format reflecting their learning style. In addition, the project will involve accessing electronic bulletins along with the TNT network for student and teacher communications.

PROJECT FOCUS
Use computer networking to enhance student involvement in data collection activities related to science and the world.

6. Polytechnic Preparatory Country Day School. Polytechnic Preparatory Country Day School is a nonpublic 5-12 school with an enrollment of 633 students. The school has installed an extensive computer center of 25 networked Macintosh computers for student and teacher use. The student library is entirely computer-based and is accessible to students and faculty at school and from home over modems. Polytechnic is a model school for the Dewitt/Wallace Scholarship Program, which encourages minority college students to enter the field of teaching.

Polytechnic Preparatory Country Day School will use the mini-lab they receive as a Phase 2 project to enhance student involvement in the data collection activities required for the fundamental discovery approach used in learning about science and the world.

STATE EDUCATION DEPARTMENT/DATA GENERAL CORPORATION PARTNERSHIP.

In February 1991, Commissioner Sobol announced a "Secondary School 1995" partnership with Data General Corporation. "We are pleased for the opportunity to enter into this partnership for international communications with Data General," said Commissioner Sobol. "It is an excellent example of the way partnerships with business can improve education without burdening taxpayers." Two secondary schools were selected to participate in this partnership.

1. Owego Apalachin Central School District, Owego Free Academy. Owego Free Academy, in Owego Apalachin Central School District, is a 9-12 high school, with an enrollment of 755 students. The district's Computer Education Committee establishes strategies for integrating technology within all curriculum areas.

PROJECT FOCUS
Use technology for international communications and courses, including SED syllabi.

Owego Free Academy science, computer graphics, English, and social studies teachers will pilot the Data General grant. They will experiment with Intellibook/DocuSource software in such courses as "Participation in Government," "Great Writers," "Biology," and "Computer Graphics."

Students and teachers will also be involved in cross-cultural (international) electronic communications activities. This will be accomplished by accessing Data General's worldwide communications network to Singapore and the Soviet Union through the TNT System. This will include Owego Free Academy, the Raffles Institution, School #1207 in the Soviet Union, and Guilderland High School.

2. Guilderland Central School District, Guilderland High School. Guilderland High School, Guilderland Central School District, is a 9-12 building with 1,285 students. The district's Technology Committee provides information to various curriculum and building cabinets. The district is currently revising its long-range plan, which was based upon the *Technology Planning for Improving Schools (TPIS)* model. Guilderland's card catalog is fully computer-based for on-line student access. The entire district is networked with over 120 Data General accounts. Additional access to electronic mail is provided through a network connection to Technology Network Ties (TNT).

PROJECT FOCUS
Use technology for international communications and interdisciplinary courses.

Guilderland teachers will pilot Intellibook/DocuSource software, the computers, the multimedia teacher presentation system, and the scanner received under the grant to experiment with three courses: a combined 10th grade English and global studies course; a combined 9th grade Regents mathematics, earth science, and computer programming course; and a combined art animation and media course. Students and teachers will also be involved in the cross-cultural (international) electronic communications activities.

"Data General recognizes the important role that technology plays within the New York State school system. It is certainly to the advantage of both the education and business communities to work together to encourage the use of computer technology to foster cross-cultural communications and innovative ways to educate students," said Data General's President and Chief Executive Officer Ronald L. Skates.

STATE EDUCATION DEPARTMENT, NYNEX CORPORATION PARTNERSHIP.

The State Education Department and NYNEX Corporation recently agreed to conduct technology staff development workshops for 1200 (K-8) New York State teachers. The workshops will be held at 60 locations throughout the state during the next twelve months.

STATE EDUCATION DEPARTMENT/MICROSOFT CORPORATION PARTNERSHIP.

Microsoft Corporation donated their integrated software package *Microsoft Works* to New York State schools participating in the industry partnerships forged with IBM Corporation, Apple Computer, Inc., and Data General Corporation. In addition, several New York City public schools, designated as Schools Under Registration Review (SURR), received *Microsoft Works*.

Microsoft Works is an integrated software package that includes word processing, spreadsheet, database, and communications modules. Under the partnership agreement, each of the 26 partnership schools and 18 SURR schools received a computer network version of *Microsoft Works*. Over 1,590 computers were authorized for teacher and student use of this software toolkit.

Students and teachers are using *Microsoft Works* for many activities, including:

- Students use the **communications module** to connect to national databases of scientific information. Students access data, transfer this national data into their own databases, and produce graphs based upon this data. The graphs are incorporated into reports they have written using the **word processing module**. The reports, in turn, can be shared with other students regionally, nationally and internationally using the **communications module**.

- The **word processor module** includes a spelling checker, thesaurus (available on PC version), and a drawing program (available on the Mac version only). Students use these to write illustrated articles to share with other students using the **communications module**. Several articles can be incorporated into a desktop publishing program, producing a regional magazine of student writing.

- Students develop **databases** on their own family heritage to share with other students using the communications module. Word processed reports can then be produced that incorporate family photographs and other pictures electronically scanned into the document.

- Students use the **spreadsheet module** to calculate the points on a line to enhance their understanding of graphs. Using the **charting module**, the line created by the equation can be observed and then changed to produce a new line. This increases their understanding of the effects of mathematical equations.

Summary.

Chapter 7 includes brief vignettes of several industry partnership school sites that received technology resources to pilot New York State's *Long-Range Plan for Technology*. The partnerships include:

- SED/IBM Corporation Joint Study Program
- SED/Apple Computer Inc. Partnership Program
- SED/Data General Corporation Partnership
- SED/NYNEX Corporation Partnership
- SED/Microsoft Corporation Partnership.

The sites that received technology under these partnerships provide instructional support staff with current demonstrations of effectively integrated technology systems and programs.

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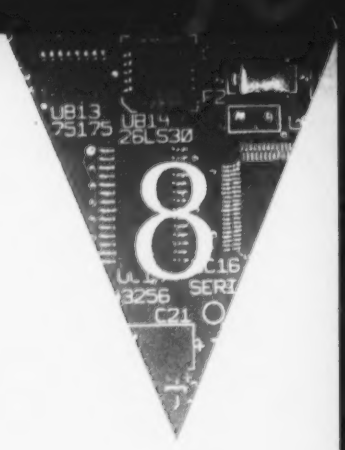

FUNDING FOR TECHNOLOGY IN INSTRUCTIONAL SUPPORT SERVICES

The provision of funding is critical to ensure that schools have adequate resources for technology planning, implementation and staff development. There are several State funding programs that provide comprehensive support for the acquisition and use of technology. In addition, there are federally-aided programs that can also be used for purchasing technology and for supporting planning and staff development activities.

The following is a brief review of State and Federal funding programs for technology.

STATE TECHNOLOGY FUNDING.

State Aid for Computer Hardware Purchase/Lease.

Beginning in 1984-85, aid has been provided to public school districts for the lease or purchase of minicomputers or microcomputers or computer terminals based on each district's building aid ratio. The aid can also be used for the purchase of computer peripherals, CD-ROM devices, video disc machines, and other computer-based hardware. Approximately $9.5 million in aid was provided in 1990-91. This aid program is restricted to the acquisition of computer hardware and related peripherals for instruction only. School districts must provide matching funds in order to receive the aid.

State Aid for Computer Software Purchase.

Since 1985-86, aid, up to $3.00 per pupil enrolled in public and nonpublic schools, has been provided on a yearly basis for the purchase of computer software, CD-ROM software, video discs, and other electronic media. The software programs and associated media purchased with these funds must be used for instructional purposes only. This program does not require matching funds. Approximately, $9.1 million in aid was allocated in 1990-91.

BOCES Shared Services Aid for Instruction and Management.

Over $29 million was provided in aid in 1990-91 to provide a variety of computer instructional and management services to school districts. Management computer services include either central or distributed processing for fiscal management, stu-

dent services, State reporting, or other related management activities. Instructional computer services and computer instructional support services include the provision of integrated learning systems (ILS), microcomputer services, staff development, planning activities, and guidance services.

Computer Services for "Big Five" Cities.

Over $25 million was provided in 1990-91 for computer management services to the State's "Big Five" cities. These services parallel the same computer management services provided under BOCES shared services aid.

Technology Network Ties (TNT).

First funded in 1985-86 at a level of $3.5 million, funding is used to support the development of the statewide TNT network, network enhancements, database installation, hardware and software upgrades, and personnel. TNT received over $3 million in funding in 1990-91.

Comprehensive Instructional Management System (CIMS).

Funding of $5 million has been provided annually since 1985 to support CIMS, which is a systematic process for the development of a curriculum or set of learning outcomes; assessment instruments to measure student progress through the curriculum; and a set of teaching-learning strategies and the provision of staff development for teachers and administrators. Computer technology is used in CIMS to generate and store information from the assessment process, as well as provide analyses and reports for teachers and administrators.

Student Information System (SIS).

A $7 million appropriation was first provided in 1987-88 for the development of a comprehensive Student Information System (SIS) in the State's "Big Five" cities. The 1990-91 allocation was $9 million. This program requires local matching funds.

Model Schools Program.

Funding for the Model Schools Program has been provided since 1985. The 1990-91 funding was $300,000, which represents combined funds provided from both TNT and CIMS. The funding has been used to support planning, comprehensive staff development activities, and the development of technology-based lesson plans. It should be noted that a new BOCES shared service was introduced in 1990-91 to support school districts who wished to participate in the Model Schools Program.

Youth-at-Risk Clearinghouse.

Funding was originally provided in 1989 to support the development of a Youth-At-Risk Electronic Clearinghouse. The project includes three major components: (1) TNT/PROFS electronic messaging capability for Youth-At-Risk administrators; (2) a Youth-At-Risk computer conferencing capability; and (3)the development of two research databases.

TNT/Distance Learning.

This program was funded at a level of $325,000 annually for 1986-87 and 1987-88. Grant awards to BOCES and school districts have supported needs studies, planning activities, and the actual development and delivery of distance learning instructional and staff development programs. Five planning and four implementation grants were awarded in 1986-87. Nine additional grants were awarded in 1987-88.

Special Legislative Grants to Individual Schools.

Approximately $2.5 million was provided in 1990-91 in the form of Special Legislative Grants to individual school districts to support a variety of instructional and management technology projects.

FEDERAL CHAPTER 1, CHAPTER 2, TITLE II, AND STATE PSEN, PCEN FUNDING.

Federal Chapter 1, Chapter 2, and Title II as well as State PSEN and PCEN funds may be used to support a variety of technology activities and initiatives, provided these technology activities are consistent with the focus and legal requirements of the program and have been approved by the appropriate State Education Department offices. The funds can be used for the purchase of instructional technology hardware, software programs, Integrated Learning Systems, peripheral devices, video equipment, and modems. These funds can also support critical technology planning activities and the provision of staff development for teachers and administrators.

These Federal and State funding sources can be used for acquiring technology hardware and software programs, supporting training and planning activities, and for providing instructional and management services to schools. The State Education Department's Bureau of Grants Compliance should be contacted for additional instruction on application procedures and guidelines for these funded programs.

Prior approval for implementing any Federal and/or State supported technology projects must be obtained from the Regional Offices listed below:

Michele Nowosad
Director, Division for Grants Management and Compliance
New York State Education Department
55 Hanson Place, Room 584
Brooklyn, New York 11217

Zenobia O'Neal
Bureau Chief, Grants Compliance,
Upstate
New York State Education Department
Room 883 EBA
Albany, New York 12234

Sandra Norfleet
Bureau Chief, Grants Compliance,
Downstate
New York State Education Department
55 Hanson Place, Room 584
Brooklyn, New York 11217

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WESTERN REGION

Lucy Tretiak-Caruso, Manager
Joseph Constantino

New York State Education Department
Erie 1 BOCES
2 Pleasant Avenue, West
Lancaster, New York 14086
(716) 681-0100

CENTRAL REGION

Harrison Woods, Jr., Manager
Martin Murphy
Nancy Spaid

New York State Education Department
5000 Edinger Drive, Room 106
Fayetteville, New York 13066
(315) 446-1323

EASTERN REGION

Leo Rausch, Manager
Werner Jacobsen
Rosalyn Reich

New York State Education Department
Room 883 EBA
Albany, New York 12234
(518) 474-3535

MANHATTAN, STATEN ISLAND, LONG ISLAND, WESTCHESTER, AND PUTNAM COUNTIES

Karen Aderinto, Manager
Gilbert Cox
Desmond Nunan

New York State Education Department
55 Hanson Place, Room 584
Brooklyn, New York 11217
(718) 260-2647

BRONX, LONG ISLAND, WESTCHESTER, AND PUTNAM COUNTIES

Michael M. DeSantis, Manager
Robin Duncan-Brooks
Andre Joseph
Patricia Wong

New York State Education Department
55 Hanson Place, Room 584
Brooklyn, New York 11217
(718) 260-2647

BROOKLYN, LONG ISLAND, WESTCHESTER, AND PUTNAM COUNTIES

Raymond Toth, Manager
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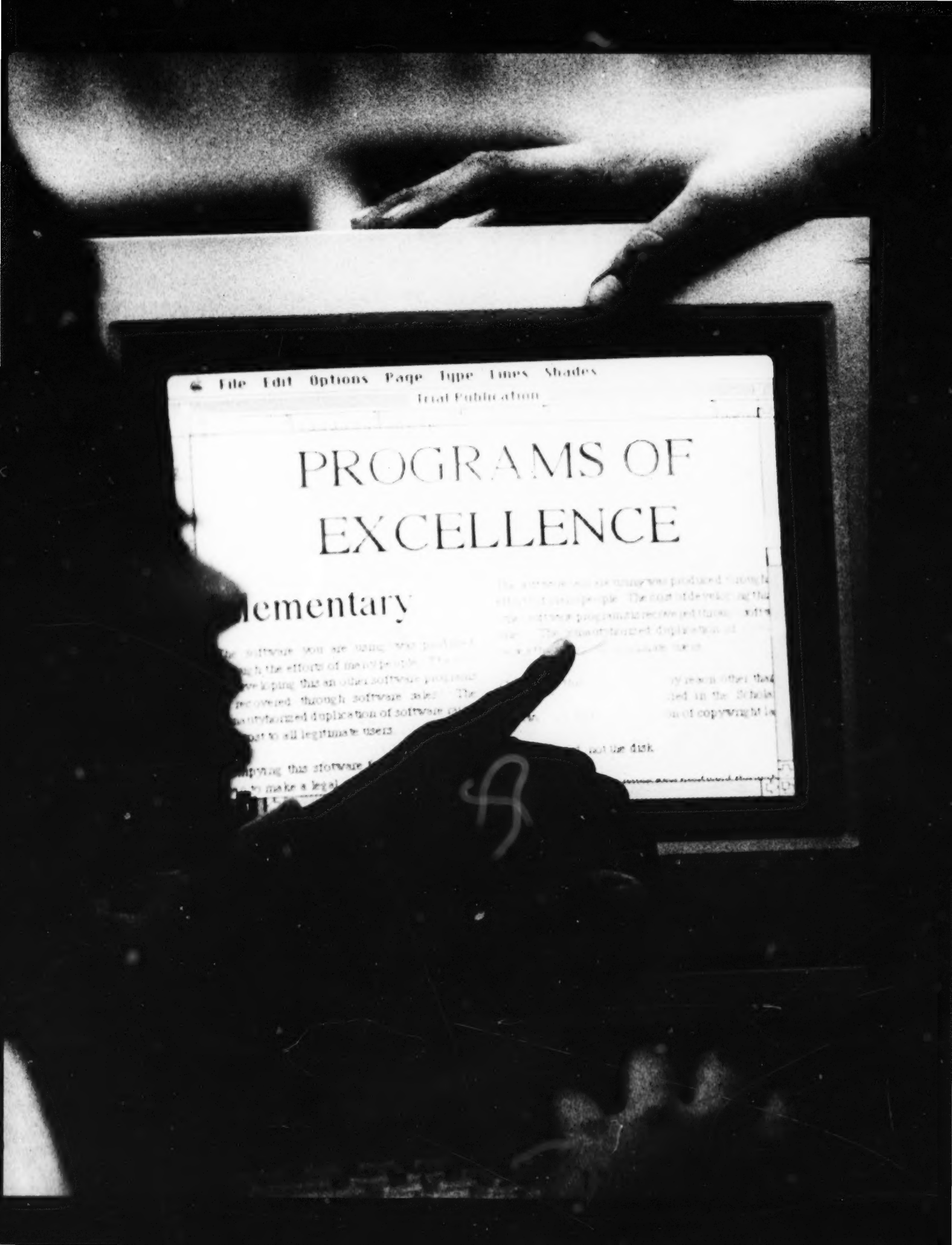
Summary.

Chapter 8 describes several State and Federal funding programs for supporting school district acquisition and use of technology for instruction and management. State funding programs include the following:

- Hardware/software aid.
- BOCES aid for computer instruction and management
- Computer services aid for "Big Five" cities.
- CIMS, SIS, Model Schools, TNT, YAR, and TNT/Distance Learning funding.

Federal sources of funding for technology include Chapter 1, Chapter 2, Title II, and State PSEN/PCEN funds. A list of the State Education Department's Bureau of Grants Compliance Regional Offices is included because these offices will serve a critical role in helping instructional support programs obtain approval and funding for their technology plans.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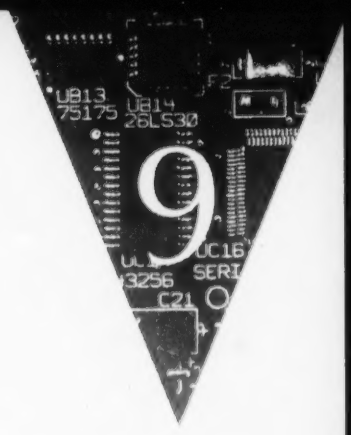

PROFILES: TECHNOLOGY APPLICATIONS IN INSTRUCTIONAL SUPPORT SERVICES

One-hundred and sixty-two respondents (29 percent) to the spring 1991 *Survey of the Use of Computer Technology for Instruction in Instructional Support Programs* indicated that they had a promising technology application or program for sharing with other schools. As a follow-up to the survey, these respondents were requested to complete technology profiles of their promising applications. The completed profiles were reviewed by the New York State Association of Compensatory Educators' Technology Committee for inclusion in this publication. Twenty programs are briefly summarized and six selected programs are profiled in full.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

BRENTWOOD UNION FREE SCHOOL DISTRICT

Program Description: Classroom teachers working with a computer lab coordinator present students with the opportunity to write and publish their own books in a computer lab setting. Students work individually or in small groups on desktop publishing activities. In all activities involving the use of the computers, the classroom teacher and the computer lab coordinator work in collaboration to assist the students in their writing. Students learn to work with other students to develop social and technical skills and to produce their own logical framework for presentation of their finalized work. This application has been in place for two years at the South Middle School.

Students in grades seven-nine use technology to produce their own books.

Technology Used: Computer Eyes digitizing equipment, the Video Overlay Card, and *VCR Companion* were used for art slideshow presentations. Teachers and students used multimedia presentation software to produce multimedia stacks. *Aldus Pagemaker* is the software the students used to produce the final publications. The computer lab is currently being equipped with Macintosh computers. Students are also using Apple IIe and Apple II GS computers.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

GOWANDA CENTRAL SCHOOL DISTRICT

Program Description: Computers are used by Chapter 1 teachers in their classrooms and also in a computer lab to present an integrated language approach to their students.

Technology supports teacher-developed prereading and reading activities at the K-6 level in reading and math.

Students are motivated to author and publish their own books which are later laminated and bound into final publications. The students use the computers to organize their thoughts, write, edit, and print their final copy. This application presents an alternative mode for reaching students who have different learning styles.

Technology Used: Word processing software is used in the classrooms and computer lab as a tool to produce the books. Although this application has been in place for just a year, the district is planning to expand the capabilities by adding a CD-ROM for the use of the students in the intermediate grades.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

YORKSHIRE-PIONEER CENTRAL SCHOOL

Program Description: Second, third, and fourth grade students in need of special services for reading at Delevan Elementary School are placed in heterogeneously grouped classrooms. These students receive pull-in services three days a week for an hour a day. The students are offered a fourth hour a week when they use the technology in a publishing center to perfect their publication work. In the publishing center, students are assisted by a reading aide and volunteer parents who have contributed their own time to learn the word processing programs. Many of the students' writing skills are fine-tuned at this point and the children receive a printed copy of their published work. Every publication is bound and illustrated so that it will become part of the school's library collection.

Reading students in grades two-four use net-worked technology in a publishing center to produce illustrated publications.

Technology Used: Apple Macintosh computers are networked in the publishing center so that teacher aides and parent volunteers have easier access to the word processing and desktop publishing software programs. Each child's work is stored on a separate disk so that there is easy access to a "portfolio" of published pieces.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

ANDREW JACKSON HIGH SCHOOL, QUEENS

Program Description: High school math students in the course, "Introduction to Computers," learn to write mathematics software using an authoring program. The programs which the students produce, are offered to students in other classes for their use—students using technology to teach other students. In addition, the student-written programs appear in the school's computer magazine. This technology application has been offered at the high school for five years.

High school students write mathematic programs in a computer lab setting using an authoring program.

Technology Used: Students use a computer lab consisting of 16 computers to write their mathematics software programs.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

COMMUNITY SCHOOL DISTRICT 26, QUEENS

Program Description: Elementary school students use technology to produce a school newspaper called *COMPUTER COMMUTER*. Classes use the school computer lab to compose articles and incorporate graphics into a final printed publication which is reproduced and distributed to all the classes in their school building. This program has been in existence for three years at PS 115, The Glen Oaks School.

Elementary students use technology to write and produce a school newspaper.

Technology Used: The students use word processing and desk-top publishing software packages to produce the newspaper format. The computer lab contains 15 Commodore computers and four Apple IIe computers.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

COMMUNITY SCHOOL DISTRICT 10, BRONX

Program Description: Students in grades seven-nine who need additional writing skills, use technology in the form of word processing to write stories and poems. This program combines the efforts of the English, writing, and computer teachers in a computer lab setting. The students' writings are displayed in a school publication called, *The Rambling Riverdale Review*. This program has been offered for two years at J.H.S 141, Riverdale Junior High School.

Middle School students use the computer lab to write stories and poems for a school publication.

Technology Used: There are 12 Apple Macintosh computers and a laser printer available to the classes in the school computer lab. Wordprocessing software packages are used to write and edit student work.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

COMMUNITY SCHOOL DISTRICT 30, QUEENS

Program Description: Spanish-speaking students in grades three-five use the technology offered in a computer lab as a reinforcement for the reading, writing, and listening skills introduced in the regular classroom. Tape recorders are used in the classroom to initiate the activities and then the students move to the computer lab to use follow-up software programs. This program has been used by PS 69, Jackson Heights School, for four years.

Elementary school ESL students use technology to improve their skills in reading, writing, speaking, and listening.

Technology Used: Tape recorders, computers, and software are combined to create a reading, writing, speaking, and listening program for English as a Second Language students.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

COMMUNITY SCHOOL DISTRICT 10, BRONX

Program Description: Elementary school English as a Second Language students use technology provided in a classroom setting to enrich reading, math, writing, and English skills. The remedial work is individualized for each student. The classroom teachers and instructional support services teachers work closely together to provide software programs for reinforcing the skills already covered. This program has been used for two years in PS 81.

ESL and PSEN students in grades one-six use technology in the classroom to reinforce reading and writing skills.

Technology Used: The students use software programs that cover the areas of phonics, structural analysis, sequential order, math, writing, and close practice on Apple II computers with print-out capabilities.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

GLEN COVE PUBLIC SCHOOLS

Program Description: Grades K-8 in Glen Cove schools offer instructional support services which utilize computer-assisted instruction. The programs are jointly planned by the classroom teachers, computer lab managers, and instructional support staff to provide students with reinforcement in reading, language arts, writing, and math skills. The students use technology for assistance in achieving grade level skills in individually selected content areas. This program has been in place for ten years.

All district instructional support services students use technology to reinforce classroom introduced skills.

Technology Used: The WICAT system is used in a lab setting to reinforce classroom content skills for students at all grade levels throughout the district. The program is updated each year.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

BELLMORE-MERRICK CENTRAL HIGH SCHOOL DISTRICT

Program Description: Students in grades seven and eight participate in additional drill and practice programs to improve their mathematics skills. Technology is used in an individualized Chapter 1 setting and in a cluster of four computers in the regular classroom. Students work individually or together using computers and appropriate software while at the same time, the classroom teacher and the Chapter 1 teacher work with small cooperative learning groups. The cluster formation was first introduced in this program during the 1990-1991 school year. However, the Chapter 1 teacher has provided individual computer-assisted instruction for five years.

Junior High School students use technology to reinforce their skills in the Chapter 1 room and the regular classroom.

Technology Used: Computers and content area software are used in both the Chapter 1 room and the classrooms. However, projection panels will be incorporated into each Chapter 1 room for the 1991-1992 school year.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

THE CITY SCHOOL DISTRICT OF THE CITY OF NORWICH

Program Description: Over 150 students in grades two-six may receive technology equipment and programs to use with their parents at home for weekends or over a several week period. This program increases parent participation and involvement, enhances equity of access to technology, and offers remedial learning activities beyond school buildings and hours. Participating parents are instructed in the use of computers. The elementary schools have offered this program for two years.

Parents and elementary school children serve as partners in utilizing technology in a home setting.

Technology Used: Older computer equipment such as Apple II+ and Franklin Ace 1000 micro-computers, have been selected for home use as computer labs receive updated equipment. Software programs in mathematics, reading, and language development are targeted for reinforcement of classroom programs.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

ADDISON CENTRAL SCHOOL DISTRICT

Program Description: Reading and math skills are reinforced in the Tuscarora Elementary School through technology use. Word processing programs provide experience in communications skills, and in the revision and editing of students' published work. Both math and reading programs are used in computer lab and classroom settings. Technology has been used in grades one-six at Tuscarora for 10 years.

Technology allows elementary school students to improve their skills in reading and mathematics in the classroom and computer lab.

Technology Used: A program has been developed which involves the use of calculators and videos as well as computers with printout capabilities.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

OWEGO APALACHIN CENTRAL SCHOOL DISTRICT

Program Description: Fifth grade students are offered remedial instruction in a computer lab before the start of the regular school day. They are provided with reading, writing, or math instruction that is complementary and congruent with the classroom instruction. Both the instructional support services program and the classroom program concentrate on an identical set of pupil learning outcomes. This program has been offered at the Owego Elementary School for two years.

Fifth grade students receive content area instruction in a computer lab prior to the beginning of the school day.

Technology Used: Students work in a networked computer lab with IBM Model 25 computers, IBM Basic Skills software, and laser disc technology.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

PARK WEST HIGH SCHOOL, MANHATTAN

High school students use computer related activities to increase their reading scores and stimulate an interest in learning.

Program Description: High school students work in a computer lab at their own pace using software which is designed to help them improve their basic reading and writing skills. At-risk students are included in this technology application. A teacher and a technical aide assist the students in English, science, math, social studies, and reading. Students are encouraged to be creative. When a student's reading scores have improved, that student is placed in the regular classroom courses. This technology application has been used for one year.

Technology Used: The computer lab consists of 28 Tandy computers, one file server, one administrative work station, and three printers. Basic skills software is used by students.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

ALBANY CITY SCHOOL DISTRICT

High school students' motivation is increased through technology offerings in four computer labs.

Program Description: High school students use multiple types of technology instruction to improve students' math and reading skills. Additional instruction in social studies, science, and English as a Second Language is also used with specific students. Students use word processing software in computer lab settings to promote creative writing activities. They also use software to sharpen their skills through simulations, and drill and practice. This program has been continuously expanded and enhanced at Albany High School since 1987.

Technology Used: The computer suite at Albany High School is a group of four labs offering a variety of equipment in configuration designed to present multiple instructional objectives. One mini lab is dedicated to the CCC configuration. A Corvus lab is designed for word processing and simulations. Two labs are set up for programming, CAD, and other math activities.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

COMMUNITY SCHOOL DISTRICT 11, BRONX

Eighth and ninth grade students improve reading comprehension and writing skills in a communication arts lab.

Program Description: Junior High School students are encouraged to read literature such as novels, to develop whole language skills in a Chapter 1 communication arts lab. Teachers assist in guiding students in a book selection process, arrange for computer-generated testing at the completion of each novel, direct writing of class newspapers, and set up an incentive system to reward successful readers. JHS 142 has offered this technology program for two years.

Technology Used: The communication arts lab consists of five Apple IIe computers, one Macintosh computer, two Imagewriter printers, and *Accelerated Reader* and *Children's Writing and Publishing Center* software packages.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

COMMUNITY SCHOOL DISTRICT 30, QUEENS

Program Description: Chapter 1 elementary school students in grades one-six use technology in a lab setting to improve reading and math skills through individualized instruction. Instructional Support Services staff, classroom teachers, and parents are trained in the technology provided to support the children's instruction. There have been additional technology sessions offered to children after the regular school day and during the summers. This program has been offered at PS 111 since April 1990.

Elementary school children are motivated to use technology in an individualized lab setting to improve their reading and math skills.

Technology Used: An IBM WICAT lab consisting of 24 computers equipped with head sets and placed in individual cartels has been provided for the students. The administration plans to add another computer lab in PS 111.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

RAMAPO CENTRAL SCHOOL

Program Description: Junior High School students use technology to strengthen writing skills. They spend every other day in the reading/writing lab and the other day in the foreign language classroom. Instructional support services teachers and foreign language teachers use a team teaching approach. They also meet regularly to plan curriculum and evaluate the program. This program was developed to meet the challenge of implementing the State's second language requirement for students and yet at the same time, providing basic skills in reading and writing. The objectives of this program are to increase students' adaptability to different environments and modes of thinking, and to strengthen their own language skills by stressing experiences common to both languages. This program has been in use in the Suffern Junior High School for 10 years.

Seventh and eighth grade students use technology in remedial reading and writing and in foreign language instruction.

Technology Used: Word processing software is used to strengthen writing skills. The *Read to Succeed* program is used in conjunction with novels and *Microzines* are used for teaching thinking and reading skills. One computer is provided for each child.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

RAMAPO CENTRAL SCHOOL

Program Description: High school students use technology in two computer lab/classrooms to increase skills and classroom performance in English, mathematics, reading, writing, and ESL. The two classrooms dedicated to instructional support services are staffed with a computer lab assistant and several regular education teachers to provide more individualized instruction. These teachers work closely together to provide parallel instruction between all Chapter 1 and regular education programs. Suffern High School has offered this program for 10 years with periodic updates and additions.

High School students receive individualized instruction in two computer lab/classrooms.

Technology Used: Each of the two computer lab/classrooms has eight Atari computer connected to a BOCES mainframe. In addition, the students use five Apple II GS computers for word processing.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

COMMUNITY SCHOOL DISTRICT 15, BROOKLYN

Program Description: Elementary school children use the technology in a computer lab for reading, writing, math, geography, history, encyclopedia skills, and data base skills. Chapter 1 teachers work with classroom teachers to help the children involved in the program improve their content area skills, encourage their enjoyment of reading, and learn about a multi-cultural world. The staff at PS 32 has offered this program to their students for the past five years.

Students in grades K-six improve their content area skills and learn about a multi-cultural world using technology.

Technology Used: Students work on computers with the appropriate software along with laser discs and a VCR.

ORCHARD PARK CENTRAL SCHOOL

Program Description:

Instructional support services students in grades 9-12 in a Chapter 1 reading program at Orchard Park High School use technology for drill and practice, evaluation, and motivation. One of the activities offered to the students in this program involves using the computer lab to write and produce book reviews. This activity motivates students to read, allows them to apply the knowledge they have learned in a lab, and requires them to use critical thinking skills to record their reactions to the author's text.

CONTACT PERSON:
Bonnie Prunella
Orchard Park High School
4040 Baker Road
Orchard Park, NY 14127

Students follow a specific set of steps to achieve their printed book reviews. First, they read a book of their choice from the classroom or the school library. Next, they keep a journal to record their responses to the daily reading. At the end of eight weeks, students construct a book review draft, often sharing it with their peers before making corrections and rewriting the final copy.

The skills which students need to use for producing the book reviews are congruent with the skills required in the high school English program. The book review activity is often accepted by English teachers for independent reading credit in their English classes. English teachers recommend books to be purchased for this activity and they are made available to students in the classroom library.

This program activity has been offered at Orchard Park High School for three years.

Instructional Results:

Students participating in this program have acquired higher grades during marking periods and they have shown increased performance in classroom discussions. Ninety five percent of the students have read at least one novel during a 10-week period and have completed at least one book review. The students turn in these book reviews for credit in their English classes.

Technology Used:

Several software packages are used by students to achieve their final printed review. *Comprehension Power* is a program which allows students to read at a set pace and answer questions. *Work Attack* is another software program, which students use to review the meanings of English vocabulary words. *The Children's Writing and Publishing Center* software sets the written document in a two-column newspaper format.

The teacher uses an overhead projector to model reviews and to demonstrate the writing process. Students use Apple IIe computers and an Imagewriter printer to publish their reviews.

Staff Development:

A word processing workshop was presented for teachers to learn the applications of the software packages provided for student use.

Funding Sources:

The initial cost for implementation of this project was approximately $1,500 for the computer equipment, $1,000 for the software, and $500 for the books. These funds were obtained through Chapter 1 funding. The operating costs include equipment maintenance and supplies which are provided through the regular school budget.

COMMUNITY SCHOOL DISTRICT 9, BRONX

Program Description:

All 1,100 students in P.S. 62 are considered to be in need of instructional support services. The instruction provided to these students in each of the grades K-6 is supported through the use of technology at all levels in a sequential, logical manner. All the teachers work closely together using computer lab settings, classrooms, and small computer networks to help integrate technology into the learning areas and to provide accessibility to every student. Classroom teachers, Instructional Support Staff, and technology staff set goals in the various curricular areas and jointly oversee the program.

CONTACT PERSON:
J. Koplan
P.S. 62, Casanova School
660 Fox Street
Bronx, NY 10455

Basic computer literacy begins in the kindergarten classroom. By first grade, the children are using *Writing to Read* and *Writing to Express* software programs. The whole language approach is introduced and expanded in grades two and three. Desktop publishing software assists these students in creating their final written documents. Students in grades four and five work on an IBM network facility using the technology as a research tool along with curriculum correlated materials in reading, math, science, and social studies.

Instructional Results:

This comprehensive technology program approach has been used in P.S. 62 for one year. A continuing staff development program is assisting the expansion and development of this program's success. In the brief time that this program has been in place, children have become very comfortable in utilizing computer equipment and software. There has been a noted increase in reading and math achievement of 5 percent according to the national percentiles in grade levels.

Technology Used:

An IBM network computer lab uses laser discs and a CD-ROM which are tied into an Apple Macintosh II SI-based desktop publishing system. In addition, individual Apple II computers and Macintosh computers are used in the classrooms.

Staff Development:

The school staff is trained by local and Community School District 8 personnel as well as by outside specialists such as those from IBM Corporation and Apple Computer, Inc.

Funding Sources:

The cost of this technology infusion program for one year is close to $80,000 with funding coming from Chapter I, AIDP, and local tax levy monies.

CAMDEN CENTRAL SCHOOL

Program Description:

Students in grades 9-12 at Camden High School use the technology provided in a writing lab to develop and use writing skills for a variety of tasks which involve high level thinking skills. The writing center is staffed by English teachers who work in conjunction with teachers in the subject areas of social studies, music, health, science, math business, and physical education.

The writing lab provides a student-centered, nontracked environment which promotes process learning, peer interaction, and individual activity. As the students work with the tool software programs, they learn to express complex thoughts clearly. The emphasis which the program places on cross-disciplinary applications, helps students to improve the quality, quantity, and frequency of their writing.

CONTACT PERSON:
Wayne Edkin, English Dept.Chair
Camden High School
51 Third Street
Camden, NY 13316
(315) 245-3168

Instructional support services students assigned to the lab, work along with other students of varying abilities. Because of their extensive work in Middle School lab situations, these remedial students are able to help their more academically advanced peers who have had less technological experience. The writing lab program has helped to raise self-esteem in remedial students and has resulted in their ability to interact with more advanced material and text. This technology program was introduced during the 1990-1991 school year.

Instructional Results:

The students' final papers are longer by 15 percent to 20 percent. The finished work is also of a high quality and of a greater scope. Students spend considerable periods at one time using study halls, lunch periods, and portions of other classes using the writing center to complete their written work. Students' recorded grades were also higher.

Technology Used:

The technology equipment in the writing lab includes two Apple IIe computers, one IBM PC computer with a laser printer and graphics capability, and 21 IBM XT computers. The *Assistant Series* is a tool software package which is most frequently used by the students. Eleven printers and a reference library are used to support the writing. The Camden School District will add a network using a IBM model 80 file server to incorporate video disc and CD-ROM technology.

Staff Development:

In preparation to the implementation of this program, four teachers were trained in tool software applications under the Model Schools Program. They, in turn, helped to train staff who were unfamiliar with technology uses. Departmental meetings provided additional staff development including individualized sessions. Peer tutoring also played a major source of instruction and support.

Funding Sources:

During the first year of operation, 1990-1991, no additional funding was needed. Rather, a reallocation of both technology and staff resulted in a fully established, full day writing center.

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ARLINGTON CENTRAL SCHOOLS

Program Description:

Students who receive instructional support services in Arlington Elementary School use technology in the writing process. Classroom teachers, reading teachers, and instructional support services staff integrate and coordinate the writing program in grades three, four, and five with the core classroom curriculum.

Content area writing and personal narrative writing is initiated in the classroom or reading room with student work following at both sites. Although classroom instruction is given, more individual assistance is given to the instructional support services students to ensure that they are successful and are able to produce a comparable classroom product. The writing which the students produce is displayed in all the content areas of language arts, science, social studies, and health.

CONTACT PERSON:
Elizabeth Roy
Arlington Central Schools
Raymond Avenue
Arlington, NY 12603

Students save their writing on diskettes which can easily move along with them as they go to different rooms.

The teachers involved in this program conference together often as they plan objectives, methods, and materials. They also conference together with parents in order to present a whole evaluation of each child's progress.

This promising technology program has been in place in Arlington Elementary School since 1988.

Instructional Results:

The individual writing folders for instructional support services students contain many quality pieces of writing. Self-esteem has improved in students because of the increased writing they have produced. Some of these results are attributed to the fact that teachers initiate the writing with the whole class in the same setting.

Technology Used:

An IBM PC computer is provided for student use in each classroom. The reading room contains two IBM PC computers and an IBM PS/2 Model 30, all with printers and color monitors. The students use word processing software packages.

Staff Development:

Computer in-service is offered each year by teachers at the school district. Courses in writing and computer updates are available through the local Teacher Resource and Computer Training Center, the BOCES Micro-Computer Support Center, and annual conferences.

Funding Sources:

The IBM PC computers were purchased eight years ago with Chapter 1 funds.

COMMUNITY SCHOOL DISTRICT 24, QUEENS

Program Description:

P.S. 19 Elementary school students participate in a writing program which incorporates the use of technology to provide the final written product. Word processing software is used by 134 instructional support services students in grades three, four, and five to assist them in writing creative essays.

CONTACT PERSON:
Gloria Wilens
P.S. 19, Lake School
99th & Roosevelt Avenue
Corona, NY 11368-2195

The classroom teachers and instructional support services staff introduce and motivate the entire class in a classroom setting. The children then move as a group to the computer lab where they plan, create, edit, and print their final stories. The close collaboration of classroom and instructional support services teachers ensures the coordination of planning strategies and follow-up activities for working with the designated children.

Technology has been used for three years at P.S. 19 in the areas of reading and writing.

Instructional Results:

There has been a marked improvement in the quality of all the students' written work from the beginning of the school year until the end. Instructional support services students have shown high motivation and displayed strong positive attitudes toward using the technology provided in the computer lab.

Technology Used:

Students use the Apple IIe computers, the Imagewriter printer, and word processing software to produce a very finished looking product.

Staff Development:

Computer consultants from St. John's University have provided ongoing staff development for P.S. 19 staff members. Staff members also provide technology support for each other.

Funding Sources:

This elementary school has used approximately $45,000 from Chapter 1 funds and the Lowenstein Foundation to set up their computer lab.

TECHNOLOGY PROFILE
INSTRUCTIONAL SUPPORT SERVICES

ELMIRA CITY SCHOOL DISTRICT

Program Description:

Instructional support services students in grades two-six throughout the six Elmira City School District elementary schools are provided with an opportunity to enhance their reading, writing, and computation skill by using technology. Two 20-minute sessions per week, minimum, are provided to 2,500 students so that they can experience the appropriate software to meet their instructional needs.

The long-range goal of this technology program is to provide classroom-based access for PSEN students. The instructional support services staff are present for the activities and review the evaluation information.

Jostens software is utilized to provide an integrated approach to reading and language arts in support of the CIMS reading/language arts program and the CIMS mathematic program.

Instructional Results:

This program was initiated during the 1991-1992 school year. In the fall of 1991 a report was generated using the BSI Prepost Score for each of the children. PEP test and IOWA test results will be reviewed at the end of the school year.

Technology Used:

Each computer lab is equipped with 30 IBM PS/2 Model 25 computers and an IBM Model 80 file server. Each lab also has a CD-ROM player and will be equipped with a laser disc player.

The six elementary buildings are equipped with a 30-station local area network using the Jostens software. Each of the classrooms has access to IBM or Apple microcomputers for whole class instruction or remediation.

CONTACT PERSON:
William Tomic
Elmira City School District
951 Hoffman Street
Elmira, NY 14905

Staff Development:

Classroom teachers and instructional support services staff were given an overview of Josten's software training by the BOCES's staff. These workshops were conducted during the summer of 1990 and throughout the 1990-1991 school year.

Funding Sources:

Each computer lab cost approximately $129,000 in hardware, software, construction, and staff training. Local district dollars were used in combination with States hardware and software aid.

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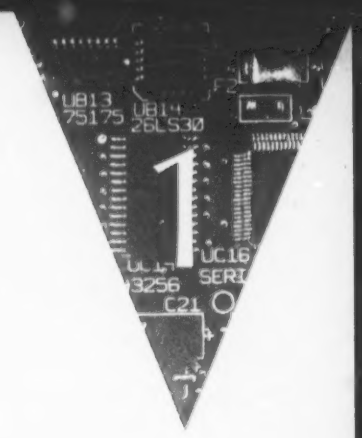

GLOSSARY OF TERMS AND PROGRAM ACRONYMS

Apple Link - Electronic mail and dissemination system operated by Apple Computer, Inc.

ATS - Automate the Schools. A Central Board of Education computer system for serving the schools, administrators, and policymakers of the New York City public school system.

Audiographic Conferencing - Teleconferencing system using PC graphics and images and audio. Participants use PCs, electronic blackboards, and speaker phones.

Backbone - Related to a network, the highest level of network activity, usually connecting major areas or nodes.

BEDS - Basic Educational Data System.

BITNET - "Because It's Time" Network. A network made up mainly of colleges and universities for electronic mail and file transfer.

BRS - Bibliographic Retrieval Service.

Bulletin Board - An electronic bulletin board allows users to conduct conversations and share files through their computers over telephone lines, thus freeing communications from time/space considerations.

Business Graphics - Business graphics are charts, graphics, or pictographs which illustrate commercial states of affairs or trends.

BUSNET - A telecommunications network used in business/marketing education for sharing information and materials.

Cable Transmission - Use of coaxial cable as medium for carrying electronic signals. An example is cable TV.

CD ROM - A CD-ROM is a large-capacity storage device which does not allow any changes to its contents.

CIMS - Comprehensive Instructional Management System.

CNS - Class Work Learning System.

Compac Disc - A compact disc is a storage technology used primarily for music which allows very accurate reproduction while remaining stable; i.e., it is not easily scratched or degraded.

Computer Peripherals - Computer peripherals are devices, such as printers, modems, CD-ROM drives, etc., which are attached to a computer and extend its capabilities.

Computer Simulation - Computer simulations are programs which allow users to experience the results of "trying things out" without apprehension of the results. They are useful in teaching the relations of parts to wholes, or for understanding situations which are too large for a conventional classroom (e.g., city planning) or which are too dangerous (e.g., mixing acids and bases).

Computer Assisted Instruction - Computer Assisted Instruction (CAI) is that class of software which is designed to aid a student in understanding or remembering certain information.

Computer Conferencing - A "person to group" means of communication.

Computer - A computer is a machine which, with the aid of programs (software), allows the user to retrieve desired information from a large data bank, perform rapid calculations, easily modify a document, create art work, make a presentation or compose and perform music. Its uses are not yet thoroughly cataloged.

Computer Terminal - A computer terminal is a keyboard and monitor connected to a large, mainframe computer, allowing the user to interact with the computer.

Computer Server - A computer server is a storage device, usually a hard disc, which provides programs and data files to other computers on a computer network.

Computer-Assisted Design - Computer-Assisted Design (CAD) programs allow a person to use a computer to create and modify technical drawing. In most engineering firms, this has replaced mechanical drawing and drafting because of the ease with which modifications can be made.

Congruence - A process for effectively integrating support services and core programs for students falling behind in school.

Creative Tools - In the context of computers, creative tools are those programs such as draw and paint programs, which allow users to express their creativity in the visual arts, or music software, which work with the production of sound.

Data - Data are collections of information.

Database - A database is an organized collection of interrelated information.

Database Management System - A database management system allows programmers and users to manipulate a database to enter or change information and to produce reports.

Desired Outcomes - A Local Educational Agency (LEA) goals to improve educational opportunities of educationally deprived children.

Desktop Publishing - Desktop publishing software allows a user of a personal computer to arrange text and graphics in a pleasing, informative manner. This software has virtually replaced the former "pasteup" process in the modern publishing industry.

Distance Learning - Use of technology to provide instruction to different geographic locations simultaneously. Uses different types of technology and/or systems.

Dow-Jones - News retrieval, on-line system for news feed retrieval and stock market quotes.

Downlink - A satellite receiver antenna.

Download - When a user transfers a program or data file from a large computer to a smaller one, one downloads that program or file. In common usage, however, the term has come to mean any reception of information by a computer.

Electronic Encyclopedia - An encyclopedia contained on some form of electronic medium, with software to allow users to search, more or less easily, for a desired piece of information. The electronic medium is often a CD-ROM or videodisc. The information may contain text, graphics, movies, and/or "sound bites."

Electronic Mail - A general name for noninteractive communication of text, data, image or voice message between a sender and a designated recipient utilizing telecommunications links.

EtherNet Backbone - A type of Local Area Networking Topology. Ethernet is a "bus" topology.

FAME - Financial and Administrative Management for Education System.

Fiber Optic Transmission - Use of fiber optic cable as a carrier for electronic signals.

File Server - A file server is a synonym for a computer server.

Gateway - A connection between networks to provide services between networks.

Graphics Program - A graphics program is a piece of software which allows a user to create graphics. These programs can either be creative tools or used to create business graphics.

Hardware - Hardware includes such devices as computers, printers, modems, etc., which are machines. The rule for distinguishing hardware from software is "If you drop hardware, it will break."

High Speed Data Connection - A data connection, usually higher than 9,600 bits per second.

Hypertext/Media - Hypertext/media is a way of storing information in such a way as to ease movement between related items and topics. This allows the user to determine the order in which information is presented. Hypertext is, as you may expect, textual information; if the information is contained on several storage forms, such as videodisc or tape, or CD-ROM, the term hypermedia is used, if not preferred.

INFONET - IBM's worldwide, Information Network.

Instructional Applications - Use of technology for enhancing instruction.

Instructional Support Applications - Use of technology for enhancing the management of the instructional process.

Integrated Learning System (ILS) - A computer-based system that provides a full curriculum for different grade levels and levels of difficulty.

Integrated Software Tools/Packages - Programs which contain more than one module are often called Integrated Software Packages. A truly integrated package also contains a mechanism for easily transferring information between the modules. An example would include word processing, spreadsheet and database modules, as well as the means to transfer reports from a database into the word processor.

Interactive Video - Interactive video contains a library of video images, usually in disc form, and software allowing users to determine the order in which scenes are displayed.

INTERNET - A "network of networks." Sometimes referred to as NSFNet, it is a national network linking computers using the TCP/IP protocol.

ISI/CCC - Instructional Systems Inc./Computer Curriculum Corp.

ITFS - Instructional Television Fixed Service. A portion of the microwave broadcast bandwidth reserved for use by education instructors.

Job Link - A computer-based job placement and career planning program.

Jostens - The Basic Learning System of Jostens Learning Corporation.

Keyboarding - In an educational setting, a class which teaches students the skills necessary to use a computer keyboard. In a business setting, the act of entering data into computer by pressing keys on a keyboard.

Ku-band Satellite - A satellite system using transmission frequency in the Ku-band.

Laser Disc - A high-density storage device which can store text, still pictures and/or full-motion video, with sound. Some 55,000 frames of still information can be stored on a single disc or one-half hour of video, with two selectable audio tracks, allowing either stereo sound or bilingual monaural tracks.

LEAP System - Local Education Agency Programs (LEAP) Evaluation and Reporting System.

LEP - Limited English Proficient.

LEXIS - An on-line system for legal information retrieval.

LRP - Long-Range Plan for Technology in Elementary and Secondary Education in New York State.

Mainframe Computer - A large hardware device designed to meet the needs of at least hundreds of users simultaneously.

Management Applications - Uses of technology for enhancing administrative decisions and school district management.

Microcomputer - A small hardware device designed to meet the needs of a single user.

Microwave Transmission - Use of microwave radio transmitters for carrying digital and analog information.

Minicomputer - A medium-sized device designed to meet the needs of between 2 and 100 users.

Modem - A hardware device which allows computers to exchange information and commands over telephone systems.

Multimedia - An overused term implying the use of more than one medium (e.g., sound, music video, still graphics) to present information under the control of a computer. The computer sequences the presentation and issues start/stop commands to the devices (such as a videodisc or CD player) at the appropriate time.

NEXIS - A component of LEXIS

NYCENET - New York City Board of Education citywide telecommunication network which allows all school personnel to pool information, exchange items, and communicate with other users and the Central Board of Education.

NYSERNET - The New York Regional Network of the national Internet.

On-line Databases - Large collections of data, usually stored on a mainframe computer by a commercial agency, with software allowing many users to receive answers to inquiries simultaneously.

One-Way Communications - Communications system that does not support interactive communications.

Optical Data - Optical Data Corporation.

PALS - Principle of the Alphabet Learning System.

Part 200 - Part 200 Management System for Special Education.

PLATO - Plato System.

PROFS - IBM's Professional Office System.

Satellite Transmission - Use of an "uplink-downlink" system to broadcast electronic signals.

Scanner - A scanner is a device which allows users to input text or visual data into a computer without using a keyboard.

SIS - Student Information System.

Software - Software is a term used for programs which contain instructions for computers.

Software Tools - See Tool Software.

Spreadsheets - Spreadsheets are programs which are designed to perform structured mathematical operations quickly and comparatively easily. They are widely used in office and commercial environments, where they have nearly replaced pencil-and-paper bookkeeping.

Student Talk - A student computer conferencing component on BUSNET.

Teacher Presentation System - A collection of hardware which allows a teacher to present information to a large group of people. It should include, at least, a computer with a large (usually 25") monitor. It may also include such peripherals as a videodisc player or players, CD-ROM drives, speech and/or music synthesizers, and videocassette players and/or recorders.

TechNet - An interactive computer-based network through which technology educators can share ideas, tests, and materials.

Technology Support System - An interrelated set of human and material resources and processes directed to the accomplishment of program objectives.

Telecommunications - Use of telephone and other transmission media (cable, fiber, microwave, etc.) to carry and convey digital and analog information.

Television Receiver - A television that receives broadcast or cable television signals.

Three-Dimensional Rendering System - Rendering software allows the computer to draw objects in such a way that they appear to be solids. Sophisticated systems will also allow the user to "turn" the object to view it from different angles, or allow the user to "walk through" rendered scenes which contain many objects.

TLC - Teaching and Learning with Computers.

TNT - Technology Network Ties.

Tool Software - Tool software, such as word processors, database management systems and spreadsheets, allow users to complete tasks with comparative ease.

TPIS - Technology Planning for Improving Schools.

TRACKER - New York Student Achievement Tracker.

Two-Way Communications - A communications system that supports interactivity.

Uplink - A satellite dish capable of "sending" a signal to a satellite.

Upload - When the user of a small computer sends information to a larger computer, this is known as an upload. More generally, any computer sending information or files to another.

VALE - *Voy a Leer Escribiendo* (Spanish version of IBM's Writing to Read).

Video Cassette Playback/Recorder - A machine used for recording or playing videotape cassettes.

Video Disc - A video disc is a 12-inch hard plastic device, much like the music medium of a long-playing record, which contains video images. These images can either be one-hour of full motion video (movies), or 55,000 still frames, or combinations of the two. Most video discs also contain two audio tracks, allowing either stereo sound or two separate audio treatments (for instance, two languages).

Voice Mail - Electronic system using telephone technology to "store and forward" voice recordings. An elaborate answering machine designed for group use.

WICAT - WICAT System.

Word Processor - A word processor is a program which allows the user to enter, modify, retrieve, edit and print textual material. In modern office practice, word processors have nearly eliminated typewriters for the production of text. More modern word processors also allow extensive formatting of documents (columns, etc.), inclusion of pictures, and even audio material.

YAR - Youth At-Risk Electronic Clearinghouse.